ASSEMBLY
AND
SERVICE MANUAL
FOR THE
E.R.A. 289FIA/USRRC

Chassis 2126 on
and
289 Slabside

Chassis 3001 on

Revision 5G
4/2013

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The Manual

The text and layout of this manual was done with Word for Windows. Some of the illustrations were hand drawn and scanned, some were done in DesignCad 2D and 3D. Spelling errors are the fault of the spel chekker...

NOTE ON MANUAL UPDATES

This manual was current at the time of your car's delivery. Any critical corrections will be mailed to you. If we can think of any thing that can be helpful but are non-critical, I will post them on the internet at:

http://www.erareplicas.com/fiaman/

The latest entire manual in PDF format is posted on the internet.
Please e-mail us for the location.

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The Legal Stuff

Information in this manual is correct to the fullest extent of our abilities. Era Replica Automobiles assumes no liability for any direct, indirect, incidental or consequential damage resulting from the information within

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*This manual is arranged by **assembly sequence,** not topic. For information on a specific topic - assembly or service, see the index at the end.*

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READ ME FIRST

Congratulations on your selection of the E.R.A. 289FIA! We at E.R.A. hope that assembling your kit will be a pleasant experience. We share your goal of creating a great automobile.

Our objective, when we started on the design and production of this kit was to create a Cobra replica better than all the rest. To keep quality consistently high, we have designed-in almost everything, making this kit one of the easiest to build.

Even though the E.R.A. 289FIA kit is extremely complete, we realized that it is your labor that puts the final quality into the product that bears our name.

If you have problems, E.R.A. will help you as much as possible to complete your kit. After all, you are really an extension of our production line. And please, feel free to offer suggestions that might improve the end product or the process of construction. Many of our production changes come from customers' requests.

***Remember**, the **E.R.A. 289FIA Cobra replica** is usually a very good investment! Of course you are free to make "improvements" to the design but be aware. Changes from the original Cobra concept may not increase the value of your car, and may even decrease it. E.R.A. has spent many years perfecting the details of the 289FIA.*

We would love to hear from you, but.... **Please**, if you have a problem, **read the manual first**! We have tried to include all the information necessary for you to complete this project in a timely fashion.

Information on the parts required starts on page 8, parts preparation on page 29, and the actual process of assembling the components begins on page 67.

Please insert any addenda before you start.

Some of our electrical equipment may vary, depending upon the supplier. Therefore, **the wiring instructions** are included with the wiring harness, not in this manual.

This manual is organized in **assembly sequence**, not by subject.

Use the **index** to find a specific topic.

Have fun!

The Legal Stuff

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SECTION A
PARTS NEEDED

In this section we describe the components necessary to complete your E.R.A.289FIA, together with part numbers and sources. Normal wearing parts that may need replacement after use are also listed.

Replacement parts (for long term service) are listed on page 135.

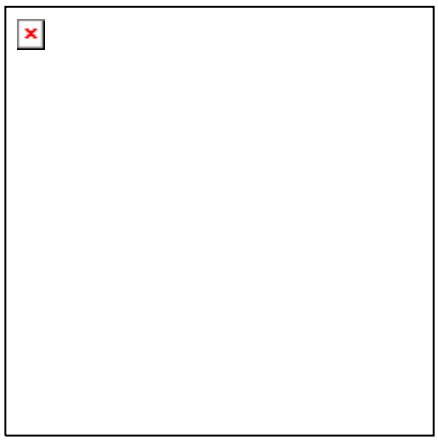
Read this section thoroughly before purchasing any parts. Don't waste your time and money on stuff you don't need or can't use.

PICKING UP YOUR KIT

The kit can be transported from our factory in an enclosed trailer, standard automobile trailer or rampback hauler. Shipping space for the parts in cartons will also be required, although most will fit inside the kit. We have used several shipping commercial companies with excellent results. See page 27 for names.

DIMENSIONS AND WEIGHTS

800 lb. bare + 200 lb. of boxes + 600 lb. for roller



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TRAILER REQUIREMENTS

If you didn't buy a "roller" from us, the kit is usually shipped on the dolly wheels that we use for assembly if your trailer is well sprung. The dolly wheels require a $300 **refundable** deposit. Many people keep the wheels until their kit is completed - it's very convenient for the kit to be mobile (and at the correct height) during construction.

The track of the Cobra dolly wheels is only about 20". Your trailer may require additional boards to support the dolly wheels. Without tires or dolly wheels, you can put tires as buffer between the chassis and the trailer. The kit will have to be lifted on and off the trailer manually. Have 3 strong friends to unload! If you're coming on a weekend to pick up your kit, please warn us if you aren't coming with extra people too. **Don't tie down the dolly wheels to secure the kit. Tie to the chassis or suspension.** In the absence of suspension pieces to tie to, wrap soft tie straps around the front crossmember and the upper mounting bolts for the rear subframe.

TIE-DOWNS

You or your shipping agent will require ratchet tie-downs, come-alongs and/or strong straps. We recommend either 4 diagonal connections or 2 longitudinal and 4 lateral ones for a total of 6. Don't forget that the **trailer must have anchor points for the straps to tie to**.

To avoid scratching the paint on the chassis, use 2" wide loops (or double 1" wide loops) or ratchet straps, 5000 lb. minimum rating. Make sure that your trailer has places to tie to. If you use chains or a come-along, bring padding or nylon straps for intermediate connections to the chassis.

INCLEMENT WEATHER:

A plastic cover will quickly shred at highway speeds. A high quality cloth car cover can be used to cover up the plastic, but it must be held down with rope all over. Looseness will allow any cover to quickly beat itself (and your paint job) to death.

SPECIAL NOTES

Be careful when selecting and building your components. The information on the following pages shows the recommended parts for many possible drive-train combinations.

The **ERA 289FIA chassis and body** follow the dimensions of the original Shelby 289 competition car very closely. For your convenience, we have tried to make the design as flexible as possible: Now, there is room for the 351 engine and various other transmissions. In the end, though, your mechanical components must conform to **similar space limitations** as the original car. Some configurations fit together better than others, and some cannot be done without major surgery. The foot-boxes have been designed to accommodate the 351 Windsor engine. Don't expect to put an FE engine in without major modifications.

WHEN YOU BUY PARTS, KEEP THE RECEIPTS!

They are frequently necessary for inspection and/or registration

The following items are **critical** to the proper assembly of the E.R.A. 289FIA. Details for selecting each component are listed in this section. Components requiring special preparation are detailed in Section B. **All the items listed below are available from E.R.A.**

Engine, page 9

Engine accessories, page 21

Oil cooler system (optional),

Transmission - Ford Top-loader 4-speed, C-4 or C-6 automatic, T-5, Tremec or Richmond Gear 5-speed

Transmission shift linkage and lever

Driveshaft

Jaguar XKE or XJ Sedan rear drive/suspension unit

Hand brake lever and cable

Flaming River rack and pinion steering gear

Steering wheel, column and hub

Front brake rotors and calipers

Front coil -over shock absorbers

Exhaust system, side or under-car

Speedometer cable

Wheels and tires

Radiator expansion tank and hoses

Windshield wiper motor and drive components

Emblems

Spare tire

Jack and lug wrench (or knock-off hammer)

Remember! The more exotic you get, the more likely you are to have problems. There is a maxim in engineering practice:

Keep It Simple, Stupid!

PLEASE! READ THE ALL THE INFORMATION THAT FOLLOWS BEFORE YOU PURCHASE PARTS THAT YOU MIGHT BE UNABLE TO USE.

ENGINE

A Friendly Reminder!

All piston engines have a limited torque spread. If you decide to build a fire-breathing monster, expect to suffer somewhat at lower RPMs. Because the E.R.A. 289FIA is light, every hiccup is felt. Unless your car is for the track, most of your driving will be in the 1500-3500 rpm range. Holley recommends that you size the ***carburetor*** *by this formula: CFM= (rpm x cid)/3456. Keeping yours reasonably sized will help driveability.*

Very ***high octane*** *gasoline is scarce in many parts of the country, and octane boosters can be a pain to deal with. If you're going to do a lot of street driving, we recommend a conservative* ***compression ratio****: E.R.A. turnkey cars are usually built with 9.5:1 or 10:1, maximum. If you are using* ***aluminum heads****, you may be able to tolerate another half point.*

COOLING

Always use a thermostat in your system for street use, or a restrictor plate for racing. In warm climates, a 165°F-180°F thermostat works well. See page 34 for hints. Your **oil temperature** should also be between 150°F and 220°F. If you have an oil cooler, you may have to block the air flow or use an in-line thermostat in cold weather.

Note that the standard E.R.A. kit includes a thermoswitch that turns the electric fan on around 195F.

EMISSIONS

Requirements vary from state to state. Most states require that your car meet the specifications of the year of your engine. Check with your local authorities.

Ford Small Block Engine Specifications

	Years	Bore	Stroke	Comp-ression
260	'62-65	3.80"	2.87"	8.8:1
289	'63-68	4.0"	2.87"	9-10.5:1
302	'68 on	4.0"	3.0"	8-10.5:1
351W	'69 on	4.0"	3.5"	8-11.0:1
351C	'71-73	4.0"	3.5"	9-10.5:1

A detailed chronology of engines (with casting numbers) is in the books listed on page 140. Early engines did not have **stamped numbers** in -the block, and can only be identified by the casting numbers on the block and/or head.

289/302/351W

Pre-serpentine belt engines are easily adapted to the 289FIA. E.R.A. supplies a special alternator adjusting bracket and clutch slave cylinder bracket for all of the supported engines.

Use the alternator as listed on page 21. Install the alternator as shown on page 29.

If you have a late engine with a serpentine belt, it may be converted by changing the lower pulley, water pump and pump pulley. Preparation is on page 29.

FUEL PUMP

E.R.A. recommends a mechanical fuel pump for simplicity. We normally install the Carter M6904 (120gph) on engines that require a pump.

351 CLEVELAND AND BOSS ENGINES

These rare engines shared little with the Windsor series, having different heads and block. Built primarily for track use, ports were much too large for a wide torque spread. If you were willing to keep the engine above 3000 rpm, they did run pretty well. The 2V heads are more streetable than the 4V heads.

We don't have primary pipes for either engine, so you will have to fabricate them.

ALTERNATOR

To keep that original look, most engines in an E.R.A. are designed to use a classic-style Ford alternator with a external voltage regulator. 50-60 amps capacity is adequate. See page 21 for part numbers.

If you wish to use a later alternator with integral regulator, you must modify the wiring harness to use a 10 ohm resistor in a trigger wire from fuse 4.

CLUTCH NOTES

Because these cars are light, they put very little stress on the clutch, so a standard presssure plate is usually OK for a street-driven car.

Richmond Gear and Tremec transmissions require a **Chevy splined** driven disc of the appropriate diameter. The pressure plate can be standard Ford.

Many Tremec installations have used a concentric throwout bearing. McLeod recommends that any centrifigul weights be removed with that combination.

OIL COOLER AND OIL FILTER

Both the FIA and Slabside come standard without an oil cooler scoop, but one can be factory-added (optional).

The **optional** E.R.A. oil cooler system requires a Fram PH16FP filter or its equivalent. **Length and shape** of the filter is absolutely critical. Larger filters will require that the engine be raised off the mounts for installation/removal. Check that your sandwich adapter engages only 1/2" of the threads in the filter. Trim the threads if necessary.

A 90 degree adapter (Ford M-6880-A50) **may** allow a larger filter but we have not had a chance to check fit.

If you decide to build your own system, the specifications below may be helpful but should not substitute for good design practices.

- **Oil cooler** - approximately 14" x 3" or 6"h with AN 10 male fittings.
- #10 stainless **braided hose** -

IGNITION NOTES

MSD SYSTEMS

Neither the Stewart Warner nor our current Smith tachometer (Caebont) can be driven by the MSD tachometer output port. No adapter is required.. Some other brands may. Inquire. See the separate wiring instructions for special **wiring routing notes** and the wiring instructions for hookup instructions.

UNILITE DISTRIBUTOR

Always use a **ballast resistor** (1.2-1.6 ohm) with the Unilite system. Also, disconnect and tape the wire at the "I" terminal of the starter solenoid.

When combined with an **MSD** ignition system, a special resistor is required. Call Unilite for details.

TRANSMISSION

Transmission/Differential tables are on page 13.

The original racing 289 Cobra used the Borg Warner 4 speed, but was frequently replaced by the much stronger Ford **Top Loader** transmission. For street, the Top Loader is available in both Nascar (close ratio) and street (wide ratio) configurations.

The **T-5** and **Tremec** are very good street alternatives, with the overdrive fifth allowing excellent highway cruising. They are also about 25-40 lb lighter than Top Loader or Richmond Gear 5 speed when you include the shifter. The gear spacing is too wide on the TKO 3550 for serious track use but the TKO 600 has an optional close ratio equivalent to the Richmond Gear.

We also install the **Richmond Gear 5 speed** with good results. The relatively close gear ratio spread of the 5 speed allows a numerically lower differential ratio for better highway cruising with the first 4 gears acting like a close ratio 4 speed.

As a rule of thumb, if you do much stop-and-go driving, 9 MPH/1000 RPM is the longest 1st gear that can be driven smoothly with a fairly mild (302) engine. This means that a wide ratio Top Loader will be OK with a 3.31:1 differential ratio, a close ratio Top Loader requires a 3.54:1 or 3.77 ratio. The Richmond Gear 5 speed is much more flexible, allowing a 2.88:1 differential. The T-5 and Tremec have a fairly short first gear with overdriven 5th and can coexist with a 3.31:1 and shorter gear. Going shorter than 3.54:1 results in a "stump puller" first gear that isn't particularly useful.

FOUR SPEED TOP-LOADER

Rebuilt transmissions are available. See the list of resources or ask E.R.A.

Transmissions come in several combinations of long and short tail-shafts, large and small splined input and output shafts, and internal ratios. All the **wide ratio** transmissions have small input and output splines. It is not necessary to have the large spline input shaft with a small block. The **small spline** transmissions were fine when used in such a light car, even with a FE engine.

We recommend a **short tail-shaft** case, 24" from the mounting flange to the end of the tail-shaft housing. This will enable a longer drive shaft. Make sure that the transmission tailshaft has the mounting boss located as shown above.

SPECIFICATIONS AND APPLICATIONS:

Ford used the Top-loader was used in many cars from 1964 to 1973. However, in 1964 and 1965 the transmission had a four-hole mounting face and a 25-spline output shaft. This early transmission should be avoided. Driveshaft parts are unobtainable.

From mid 1965 to 1973, Ford changed to a universal eight-hole front mounting pattern. Also during this time, the output shaft was upgraded to a larger 28-spline output shaft for the 200 to 390 cubic inch engines and 31-spline shaft for the 427, 428, and 429 engines. Because the E.R.A. 289FIA is very light, stress on the transmission is low. We have found that the small input and output shafts are fine for street use.

Input shafts were also upgraded to 1 $^{1}/_{16}$" diameter for use with 200 to 390 cubic inch engines and 1 $^{3}/_{8}$" diameter for HD 427, 428, and 429 engines. The larger spline size was only available with close ratio gears.

The Top-loader gearbox was built in three case lengths measured from the mounting flange to the end of the tail-shaft housing: 24", 25.5" and 27"**. If at all possible use the short tail-shaft transmission**. It allows a longer driveshaft.

SPEEDOMETER DRIVE GEARS

Most Top-loader transmissions come with a right-hand thread drive gear on the output shaft. The driven gear on the speedometer cable must match. See page 14 for part numbers.

CLUTCH THROW-OUT FORK

Part numbers are on page 24. The fork must be modified. See page

TRANSMISSION MOUNTS (TOP-LOADER ONLY)

Check your transmission mounting holes for the appropriate mount:

Top Loader Transmission	Mount
Two holes in the transmission, arranged front to back	Ford C8ZZ-6068A or its equivalents, i.e. Republic or Parts Master 31-2284
Two holes arranged side to side, and having 5 $^{5}/_{8}$" between center	Same mount as above.
Two holes arranged side to side, and with 6 $^{1}/_{4}$" center-to-center distance. **Rare**!	Requires a special adapter **(**done on special order only.) Use Ford C9AZ-6080E, Republic 31-2250 or equivalent.

FORD C-6 AUTOMATIC

Use the C-6 appropriate to your engine. Because there isn't a transmission oil cooler built into the radiator, you must fit an auxiliary one, either in place of the engine oil cooler or in front of the radiator.

Mount: Ford C9AZ-6068H, Republic 31-2375 or equivalent

RICHMOND GEAR (DOUG NASH) 5 SPEED.

This transmission is loosely based on Chevrolet gears. The 5 speed has a direct (1:1) fifth speed. The intermediate gearing is lower than the Ford 4 speed so you may numerically lower your differential ratio without fear of bogging down in first gear. See the chart of speed in gears on page 13 for particulars. The R.G. 6 speed is too big to fit without major modifications.

There is also a **competition version** of the 5 speed, using straight cut gears and no synchromesh. *Not recommended* for street use.

Richmond Gear and Tremec transmissions require a **Chevy splined** driven disc of the appropriate diameter. The pressure plate can be standard Ford.

If you are using a **concentric throwout bearing**, McLeod recommends that you remove the centrifigul weights.

Rear Mount: GM 3870184

Clutch throw-out bearing, arm:

- Same as big spline top-loader

Speedometer drive parts (see page 14):

- Cable — Champ 400020
- Gear Holder (Bullet) — GM 345215
- Retainer — 3708148
- O Ring — GM 10054241
- 90 deg. adapter — AA1052
- Gear — 39879XX, (XX=Number of Teeth)
- (Generally, a 2.93:1 dif. ratio will require 19 teeth, a 3.07 ratio: 20 teeth.)

FORD MUSTANG T-5

This 5-speed transmission can be used with the smaller Ford engines. Its **overdrive** 5th gear gives excellent highway cruising, even with a 3.77:1 differential ratio. Don't expect high top speeds in 5th gear, however. The small block engine may not have the torque to exceed 4000RPM in 5th.

Because the shift linkage is integral, the shifter cannot exactly duplicate the original position, but mounts a couple of inches to the rear.

With the standard bell housing on the stock T-5, you can use a **pull-type clutch release system**.

If you are using an aftermarket blow shield (See page 24), we recommend that you change to a push-type clutch release system. Please specify before the kit is delivered.

TREMEC 3550, TKO AND 500/600

See gearing details on page 13.

Some Tremec transmissions require a **Chevy-splined driven disc**, some use a Ford spline. The pressure plate can be standard Ford. Some bell housings require a $^{5}/_{8}$" spacer so that the input shaft doesn't bottom out in the crankshaft. In addition, except for the 500 and 600 series, the rear mount requires an **adapter plate** used with a Chevy mount. See page 24 for part numbers.

We recommend a concentric-type clutch release bearing with all Tremec transmissions. Inquire for details.

Before you install the speedometer driven gear, **check that its spiral meshes properly with the drive gear.** Transmissions have come through with both the LH and RH drive gears. See page 14 for calculations and page 23 for part numbers.

BELLHOUSING

Since the clutch and pressure plate are in line with your calves, E.R.A. recommends a forged steel blow-shield bellhousing such as made by Lakewood or Quicktime.

We trim the Lakewood bottom flange so that is does not extend below the chassis. See page 32 for trimming details.

TRANSMISSION GEARING

(All based on 26" OD tire)

4-SPEED TOP LOADER, WIDE RATIO

	1st	2nd	3rd	4th
Ratios:	**2.78:1**	**1.93:1**	**1.36:1**	**1:1**
Dif.	**Speed@ 1000RPM**			
3.07	9.1	13.1	18.5	25.2
3.31	8.4	12.1	17.2	23.4
3.54	7.9	11.3	16.1	21.8

4-SPEED TOP LOADER, CLOSE RATIO

	1st	2nd	3rd	4th
Ratios:	**2.32:1**	**1.69:1**	**1.29:1**	**1:1**
Dif.	**Speed@ 1000RPM**			
3.07	10.9	14.9	19.5	25.2
3.31	10.1	13.8	18.1	23.4
3.54	9.4	12.9	16.9	21.8

T-5 5-SPEED

Some T-5's are geared like the Tremec 3550

	1st	2nd	3rd	4th	5th
Ratios:	**2.95:1**	**1.94:1**	**1.34:1**	**1:1**	**.63:1**
Dif.	**Speed@ 1000RPM**				
3.31:1	7.9	12.0	17.4	23.4	37.1
3.54:1	7.4	11.3	16.3	21.8	34.7

TREMEC 3550/TKO/500 5-SPEED

	1st	2nd	3rd	4th	5th
Ratios:	**3.27:1**	**1.98:1**	**1.34:1**	**1:1**	**.68:1**
Dif.	**Speed@ 1000RPM**				
3.31:1	7.1	11.8	17.4	23.4	34.4
3.54:1	6.7	11.0	16.3	21.8	32.1

TREMEC TKO II 5-SPEED

	1st	**2nd**	**3rd**	**4th**	**5th**
	3.27:1	**1.98:1**	**1.34:1**	**1:1**	**.83:1**
Dif.	**Speed @ 1000rpm**				
3.07:1	7.7	12.7	18.8	25.2	30.4
3.31:1	7.1	11.8	17.4	23.4	28.2
3.54:1	6.7	11.0	16.3	21.8	26.3

TREMEC 600

	1st	2nd	3rd	4th	5th	Alt 5th
Ratios	**2.87**	**1.89**	**1.28**	**1:1**	**.82:1**	**.64:1**
DIF:	**Speed@ 1000RPM**					
3.07:1	8.8	13.3	19.7	25.2	30.7	39.4
3.31:1	8.1	12.4	18.3	23.4	28.5	36.5
3.54:1	7.6	11.6	17.1	21.8	26.6	34.1

RICHMOND GEAR 5-SPEED RATIOS

	1st	2nd	3rd	4th	5th
Ratios:	**3.27:1**	**2.13:1**	**1.57:1**	**1.23:1**	**1:1**
DIF:	**Speed@ 1000RPM**				
2.88:1	8.2	12.6	17.1	21.8	26.9
3.07:1	7.7	11.8	16.0	20.5	25.2
3.31:1	7.1	11.0	14.9	19.0	23.4

SPEEDOMETER DRIVE GEARS

Ford transmissions used a **variety** of drive gears. The **Mustangs Unlimited** catalog is a good reference. The gears are illustrated and detail specifications listed.

*Note! The Ford Top-Loader **drive gear** may come with **right or left hand threads**. The driven gear must match.*

You can calculate the number of teeth on the speedometer drive gears (**part #s on page** Error! Bookmark not defined.) using the formula:

(Dif. Ratio) **x** (Tire revs/mile) **x** (Teeth on drive gear) = (Teeth on driven gear)

(Speedometer revolutions/mile)

A 295-50-15 tire rolls 760 revs per mile. Both the Stewart Warner and Smiths speedometers are usually geared at 1000 revolutions/mile.

Usually the **Ford Top-Loader, T-5** use a 7 tooth driving gear requiring a **LH driven gear**. Teeth = (Dif.Ratio) x 5.3.

Usually the **Tremec** uses a 7 tooth driving gear requiring a **RH driven gear**. So: Teeth = (Dif.Ratio) x 5.3.

The **Richmond Gear** transmission uses an 8 tooth driving gear. So: Teeth = (Dif. Ratio) x 6.06. See page **Error! Bookmark not defined.** for gear selection.

DRIVEN GEAR SELECTION AND PART NUMBERS

Ford Top-loader, T-5 and Tremec			
Diff. Ratio	**App. Teeth**	**Toploader/T-5 Left-hand**	**Tremec Right-hand**
3.07:1	16	Orange tip	Burgundy
	17	C2DZ-17271G (Purple tip)	C3DZ-17271C (White)
3.31:1	18	C2DZ-17271K (Green tip)	C0DD-17271B (Yellow)
3.54:1	19	C4DZ-17271A Pink tip	C0DZ-17271B (Pink)
3.77:1	20	C2DZ-17271H Blue tip	C1DZ-17271A (Black) C8SZ-17271A (Orange)
		Gear retainer for all above	C1DZ-17292A

Richmond Gear 5 Speed		
Diff. Ratio	**App. Teeth**	**Part Number**
2.88:1	18	3987918 (Brown)
3.07:1	19	3987919 (White)
3.31:1	20	3987920 (Blue)
	21	3987921 (Red)
3.54:1	22	3987922 (Gray)

SHIFT LINKAGE

All shift linkage is available from E.R.A.

TOP LOADER

SHIFT LINKAGE

Both the original Ford 4-speed shift linkage and Hurst linkage work well. The linkage is mounted at the forward location on the transmission. Not all top-loader tail shafts have the casting bosses for the front mount but the tailshaft can be replaced. Some may require drilling and tapping.

fia\man\b\shiftmt

LEVER

If you don't want to modify the Mustang lever yourself (see page 42), E.R.A. manufactures a duplicate the original shift lever to fit the Top-Loader, Richmond Gear and Tremec transmissions.

RICHMOND GEAR

E.R.A. modifies a Long shifter and rods for the 5-speed, using the Ford lever for control. The lockout "T" handle is there for looks, but no longer is functional. Inquire about available parts.

REAR DRIVE/SUSPENSION ASSEMBLY

*The **289/FIA** is designed to use either the **Jaguar** rear suspension (in an E.R.A. subframe) or the custom **E.R.A. suspension unit** with outboard brakes. The E.R.A. unit is available as a kit or as a complete assembly.*

JAGUAR-BASED

SELECTION

See page 23 for application list.

The Jaguar differential is the same Salisbury unit that was used in the original Cobra with only some casting changes. It is adequate for 500+ BHP, and can be made even stronger by using stub axle parts from Concours West. Gear wear is not normally a problem even in well-used assemblies, but always replace seals.

***Do NOT** replace the control arm roller and needle bearings with aftermarket urethane bushings! The net result will be wheel hop and generally sloppy handling.*

The vintage of the Jaguar differential is punched in the casting at the lower right corner of the cover. The top number indicates the year, the bottom number is a special code. (Translation: we don't know what it's used for). A simple way to determine whether a post-1980 unit will work is the presents of inboard brakes. The later (inappropriate) assemblies have brakes mounted on the hub carriers.

When selecting/buying a used rear end look for:

- **Completeness** - You don't need the Jag trailing arms or emergency brake compensator, but you do need everything else.

- **Limited Slip Differential** - Note that some XJ differentials were open. A limited slip may be retrofitted at the time of rebuild for about $700
- **Brakes** - Try to get serviceable hydraulic and emergency brakes. There were no major changes in XKE rear brake until 1968 when both the calipers and rotors were updated. The later units are cheaper and easier to rebuild than the early units.
- **Gear ratio** - There should be a tag on one of the rear cover bolts (for example, 43/13 on the tag = 3.31 ratio). If there is no tag, mark the input shaft flange and the half-shaft or brake disc for reference and rotate the axles by turning the input shaft. For every time the axles and brake disc turns over once, the input flange should rotate approximately 3 1/3 turns (3.31:1 ratio) or 3 1/2 times (3.54:1 ratio). See the chart on page 13 for the best ratio for your engine/transmission combination. If you can't find a unit with the ratio you want, you can have your gear set changed at a reasonable cost.

Dampers (coil-over shocks): All E.R.A./Jaguar rear suspensions require 4 dampers and coil springs (coil over shock absorbers). Specifications are the same as for stock Series I and II Jaguar XKE. XJ dampers cannot be used. See, page 23 for part numbers and page 48 for length specifications. Dampers with adjustable spring seats and externally adjustable damping are available from E.R.A.

The E.R.A. subframe requires lower control arm brackets from an XJ Sedan. The control arms and half-shafts will be **exchanged** for shortened pieces when you buy the subframe from us.

All mounting bushings and hardware are included with the E.R.A. subframe.

STEERING GEAR

The ERA uses a Flaming River Musting II-style gear that's 3" shorter than standard. ERA modifies the unit for different tie-rod ends. Part numbers are listed on page 24 and modifications are described on page 43.

New outer tie rods are supplied with the kit (part numbers on page 135), and the parts necessary for the gear modifications are available from ERA.

FRONT ROTORS AND CALIPERS

E.R.A. stocks standard rotors and rebuilt calipers.

WITH BOLT-ON, 5-PIN, OR DAYTON WIRE WHEELS

Most mid-sized GM cars from 1970-1978 used the correct pieces, with 2 3/8" piston calipers. *Station wagons may use incorrect parts*. Chevrolet lists the same rotor and calipers for all sedans.

Before purchasing the rotors and bearings, measure the size of the outer wheel bearings. Your rotor and bearings must be compatible with the smaller (more common) diameter (.655") at the axle outer end. The wagons used a .750" diameter axle.

WITH (6) PIN DRIVE WHEELS:

The E.R.A. pin-drive wheel conversion includes the hub and rotor, both compatible with the caliper and bearings described for the bolt-on wheels above.

With

OPTIONAL COMPETITION BRAKES

E.R.A. offers a conversion to 12.18" or 12.8" diameter (by 1 1/4" wide) rotors and Wilwood® 4 piston calipers for heavy-duty use. These require modifications to the steering knuckle.

The calipers may have **interference problems** with some wheels. Ask about specific wheels. The 12.8" rotors will only fit in a 16" or larger wheel.

DRIVE SHAFT

E.R.A. has driveshafts for most applications in stock.

This is a project for a shop specializing in power - transmission equipment or shafting. See page 42 for design details. PDF drawings are available for each application are available on the 427man section of the ERA web site.

STEERING COLUMN (UPPER)

You may use a **Triumph** unit (see page 44) as described below **or** the custom **E.R.A. reproduction column**. The E.R.A. column includes a new hub and signal/dimmer switch and requires no preparation.

TRIUMPH COLUMN

Sourced from Spitfire or GT-6, vintage 1972 to mid 1977. Get the upper column and housing, upper and lower clamps and both switches.

See page 44 for preparation and rebuilding of the Triumph column.

STEERING WHEEL

The original Cobra used a 16" laminated wood rimmed aluminum steering wheel. We have found that a slightly dished 15" wheel allows more knuckle room between the wheel and the cowl. E.R.A. offers both diameters in a reproduction of the original wheel. A hub center button with either a AC or Cobra logo is also available.

If you are using a Triumph column, you also need to adapt the Triumph hub to the reproduction wheel.

SEAT BELTS

E.R.A. offers custom competition belts, identical to the original cars. Inquire.

Standard seat belts can be installed in the threaded chassis bosses shown on page 110.

Separate left and right straps are required for dual-strap shoulder harnesses. The length of an off-the-shelf shoulder harness strap may need changing.

WIPER MOTOR AND COMPONENTS

Modified and rebuilt wiper motors and hardware are available from E.R.A.

The best wiper components are found in the 1969-1976 Triumph Spitfire, GT-6, or TR-6. Get the entire set-up including: wiper motor, wheel boxes, spacers, gaskets, chrome bezels, and the connecting tube between the wiper motor and right wheel box. See the wiper motor illustrations on page **Error! Bookmark not defined.** to help you identify the parts.

Many times, the wheel-boxes available are not correct. Measure across the teeth of your gear to the theoretical center of the cable. (Some of the gears are flat, some are concave.) If your dimension "A" is 1.45", not 1.25", the wiper drive must be modified to compensate. See page **Error! Bookmark not defined.** for details.

a\whlbox

CHECKING THE CABLE/GEAR WHEELBOX CLEARANCE

Before you install the wheelboxes, it's a good idea to check that the cable engages the gear properly. Unfortunately, the quality of the wheelboxes has not been consistent lately. Make sure that the tubes line up properly with the gear so that there is no binding, and that the cable is held close to the gear, but not so close to make excessive drag.

FRONT SHOCK ABSORBERS

E.R.A. offers custom made Spax dampers with springs. Konis are available on special order. Also available are spring collar wrenches to adjust your ride height.

The coil-over dampers should be adjustable for ride height. See the length specifications on page 48 and part numbers on page 23.

Both Koni and Spax are adjustable for damping. The Spax is externally adjustable for combined jounce and rebound damping. The Koni has separate external damping adjustments for jounce and rebound.

FRONT COIL SPRINGS:

Front Spax and Koni dampers require 12" long by 250 lb/inch (260-302CID) to 275 lb/inch (351-400CID) springs for most engines. If you have aluminum heads on the larger engine, the lighter spring will suffice. Other dampers may require a different spring length. Some spring/shock combinations may require spacers. Check with us for details.

EXHAUST SYSTEM

ORIGINAL COMPETITION STYLE

Side/under pipes were used on the original competition cars. ***Primary*** pipes for most Ford small block engines are available from E.R.A. Exact reproductions of the original side pipes (with a glass-pack type muffler) are available in various coatings and materials also.

STREET STYLE

For those desiring something quieter, the E.R.A. 289FIA and Slabside have provisions for a street-style under-car system, with the exhaust exiting just in front of the rear wheels, or at the rear bumper. The system uses a reverse-flow muffler so there is a small horsepower penalty. The primary pipes are the same as used in the competition exhaust, but with a different collector.

WHEELS, FIA

BOLT-ON

Bolt-on wheels require a 4 ¾" bolt circle (Chevrolet pattern). 7" wide wheels for the front, 8 ½" or 10" rear with 4"back spacing will result in the "right look." Using wider wheels on the rear may prevent use of the under-car exhaust system. The **offset** of your wheels must be similar to those listed for the pin-drive wheels below. Lug nut sizes are:
Front: **7/16-20**
Rear: **½-20**

E.R.A. recommends **American Racing's Torq-Thrust "D" wheels** in 15 x 7" and 15 x 8.5" sizes (3.75" backspacing.) This wheel, or one similar from Halibrand, was apparantly used on one of the original racecars in pin-drive design. The front wheel, however, will not fit the large brakes discussed on page 16. If you are using the outboard-braked E.R.A. rear suspension, the rear wheel lug nut holes must be enlarged to 0.687"and the shank of the (non-tapered) lug nuts (McGard 61000) shortened by 0.10".

A **16" Halibrand wheel** in the same style of the Torq-Thrust is also available, but in 7" width only.

Definitions:

****BACKSPACING** - The distance from the inside edge of the wheel to the mounting face.*

***OFFSET** - The distance from the centerline of the wheel to the mounting face. **Positive** offset is where the wheel centerline is **inside** the mounting face. **Negative** offset moves the wheel **out** away from the center of the car. (Some wheel companies may define the offset differently. Check!)*

PIN-DRIVE

The E.R.A. pin drive hubs require original style pin-drive wheels using 6 pin on a 4 ¼" circle.

Original (FIA) cast aluminum 15" wheels (7 ½" and 9 ½" wide are available from PS Engineering.

427 style wheels are available from E.R.A., Trigo and Vintage. These wheels require special machining to change the backspacing. Inquire for specifications.

PS Engineering and **Dr. Dix** also make 17" wheels that are up to 9" wide front, 11.5" rear. Specifications available on the 427man section of the ERA web site.

See page 126 for special **installation notes**.

PS ENGINEERING WHEEL SPECIFICATIONS

	Width x Diam.	*Offset
Front	7 ½" x 15"	-0.3"
	8" x 17"	-0.3"
	9" x 17"	+0.25
Rear	9 ½" x 15"	-1.3" *
	9-10" x 17"	-1.0" *
	11" x 17"	-0.85" *

TIRES

(Rim size appropriate for tires)

Diameter	Front	Rear
Max.	26.5"	26.4"
Min.	24.5"	25.2"
Max. Width	275mm	315mm

Lower profile tires increase the clearance between the top of the tire and the fender, giving the illusion that the car is higher than it actually is. If the car is lowered to compensate, the ground clearance will be reduced somewhat. In most of the pictures you have seen of our car, the tires used were Goodyear race tires. The equivalent tire for the street would be:
Front - 245/50HR-15 to 235/60HR-15 (street).
Note that Avon tires are sized a little differently. Use 225/65-15 in the front.
Rear - 265/50HR-15 to 295/50HR-15 (street)

Larger diameter tires can be used with different wheel offsets.

The latest information on tire brands and sizes is posted on the ERA web site.

www.erareplicas.com/427man/tires/index.htm

For Reference: $^{Revolutions}/_{Mile} = {}^{20168}/_{(Tire\ OD\ in\ inches)}$

For 16" or 17" wheels, tires in 35 and 40 series will fit. Ask for current recommendations.

*Before mounting on **pin-drive wheels**, see page 126.*

SPARE

The spare tire well will accept any wheel/tire combination that is less than 24.5" in diameter. If you keep the width small, you will gain trunk space.

If you are using bolt-on wheels, you may use a "Space Saver" spare tire as used on Camaros and other GM models. If you buy the tire with the wheel, make sure it has uses the 4 ¾" bolt pattern.

If you have a **limited slip differential** and you must use the spare on the back, fix the tire as soon as possible. Driving with 2 different size tires on the back will put extra stress on the LSD.

WHEELS, SLABSIDE

The original early cars used 5.5” wide Dunlop wire wheels, which were quickly superceded by 6” x 15” wheels. E.R.A. offers both original Dunlop wheels (which require hub machining) and Dayton wheels (which come with a bolt-on adapter). A spare would be the same size as the others.
Specifications for both wheels are posted at
http://www.erareplicas.com/ssman/index.htm

RADIATOR HOSES

Pre-trimmed hoses are available from E.R.A.

The 289FIA requires some standard molded hoses, depending on your equipment. Hoses are listed on page 22. In some configurations, the hoses must be trimmed to length. See page 34.

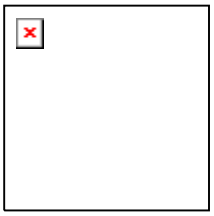
EXPANSION TANK

FIA

A Harrison tank (3155416) can be used on the optional E.R.A. front tower mount. The tank, with mounts, clamps and isolators is available from E.R.A. See page 34 and 100 for installation details.

SLABSIDE

We’re still looking for a good substitute for the original tank…



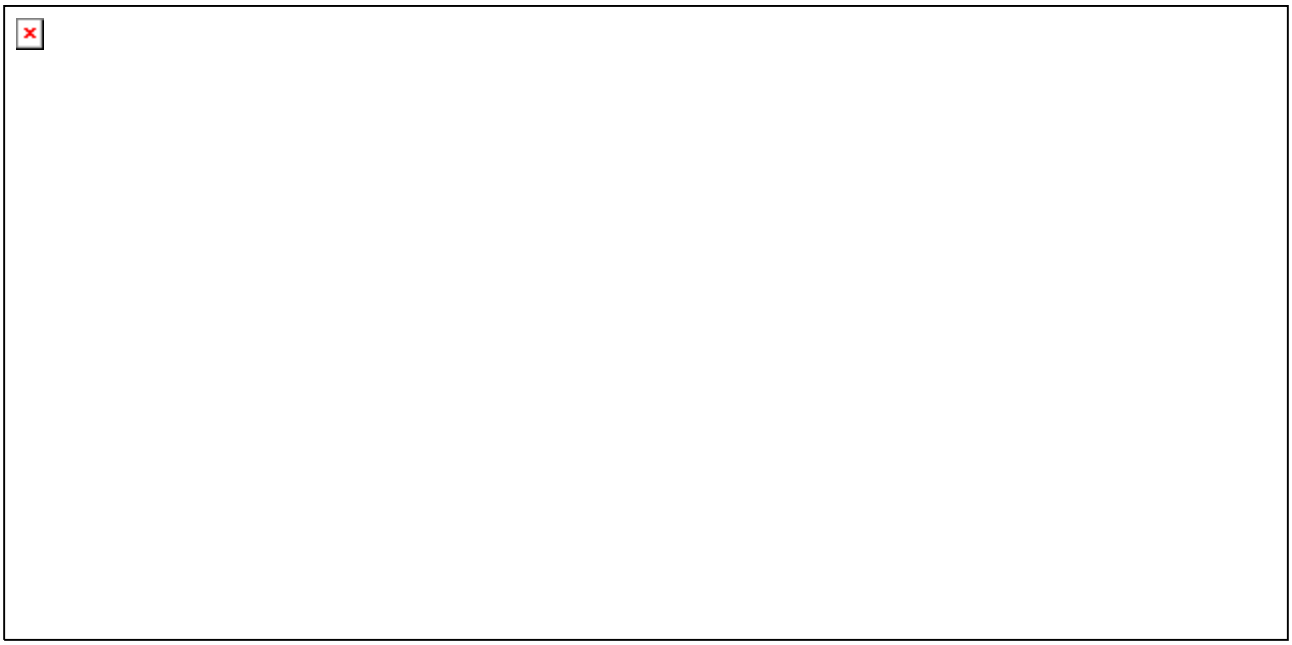
JACK, ETC.

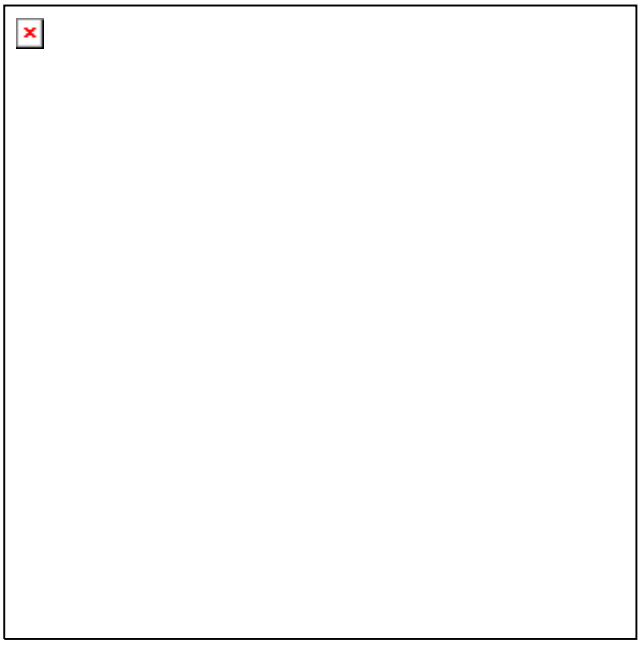
A Honda Acord scissors jack (available new from E.R.A.) works well for wheel changing, etc.

With pin drive wheels, use a lead or plastic "dead blow" hammer to remove the aluminum knock-off wing nuts. Removing them with a steel hammer will mar the wing nuts.

Hydraulic jacks, knock-off hammers, safety wire pliers and other tools are available from E.R.A.

SECTION A -PARTS NEEDED-





PART NUMBERS AND SOURCES

Source addresses, etc. are found on page 26.

PART	PART NUMBER	SOURCE
Alternator		
Ford Small Block	Delco 321-147 (rebuilt) or any '70's Ford with separate regulator.	Most Fords, 1971-1980
Insert to reduce head threads	F4ZZ-6E086-A - see mounting, page 29	Ford
Ballast resistor	Nieh FF-109 / Borg RU-6 / SMP RU-4 / Wells F795, (1.2-1.6 ohms)	Aftermarket
Fan belt	Gates 7450 XL(most app's)	
Front Brakes, Suspension		
Brake Rotor/Hub (bolt-on wheels)	GM 334348 Bendix 141040	GM dealer or many (Front) GM cars 1970-78 (see page 16)
Brake Calipers (Front)	GM 18002421, 18003761 Rebuilts: Bendix L55001, L55002 (Includes pads)	GM dealer Local parts place
Pads	Bendix D52S (Semi-metallic for street use)	
Mounting pin kit		
Banjo bolt	GM 487293	
Brake reservoir, standard optional (3)	BMW 34 32 1 112 399 ERA steel cans (optional)	ERA, BMW dealer
Bearings-Front Wheel		
Outer	GM 7450627, Timken LM11910/LM11949	GM or local auto parts
Inner	GM 7450630, Timken LM67010/LM67048	"
Seal, inner	GM 3966202, National 8871	"
Spindle nut	GM 387137	"
Spindle washer	GM 457707	"
Shock absorbers	Spax G135 PAS 200	E.R.A.
(See spec's on page 48)	Koni 8212-1126SPA1 (Double external damping adjustment w/aluminum body)	E.R.A., Summit Racing, Jegs
Coil Springs	12" x 250 lbs/in or 12" x 275 lbs/in (See page 18)	E.R.A., Carrera, Dillon, AFFCO, Eibach
Battery	Group 45 (preferred) or Group 51 (Get the **heaviest duty** possible in this size)	Misc.
Bell-housing See mod's necessary on page 32.	Lakewood 15200: Top-loader, Richmond Gear Lakewood 15202: Tremec Lakewood 15203: T-5	Various, E.R.A.
Cables, Battery		
Trans case to chassis ground	12" long, ($^{7}/_{16}$")eye/eye woven style	E.R.A., parts supplier
Battery pos to starter solenoid	135" long, eye/terminal clamp (1 gage min.) *If you want an in-line cutoff*, see page 68.	" "
Battery neg to ground	32" long, eye/terminal clamp (1 gage min.)	
Starter solenoid to starter	24" long, eye/eye (4 gage min.)	" "
Drive Shaft Components	(see page 42 for parts reference)	

SECTION A -PARTS NEEDED-

ENGINES AND ENGINE PARTS	Complete rebuilt Ford units are available from several suppliers	Ask us
Mounts		
Ford 260, 289, 302, 351	63-65 Mustang w/260-289 cid, Ford C4DZ-6038A (right), C4DZ-6038B (left) Republic 31-2221 (right), 31-2220 (left) MityMount (HD) FM132	Aftermarket, Mustangs Unlimited, E.R.A., Dealer
Oil Pan, Extra Capacity	Maximum depth of 8.5", F or R sump. Deeper pans will hang below the chassis. Windage trays are recommended for engines running consistant high rpm.	E.R.A., Canton Racing Products, Aviaid
289-302	High capacity front sump – Canton 15-610 and pickup 15-611	
	Road race (with trap doors) – Canton 15-630 and pickup 15-611	
351W	High capacity front sump – Canton 15-660 and pickup 15-661	
	Road race (with trap doors)– Canton 15-680 and pickup 15-611	
351 Cleveland	Canton 15-710 pan, 15-711 pickup	
Oil Filter	See the note on page 9.	
Exhaust System	Under-car-complete	E.R.A.
	Competition style pipes w/primaries:	E.R.A.
Fuel Filter	In-line between tank and steel line on chassis (3/8")	local auto parts store
Hand Brake Lever	Jaguar XKE Series I, II (1961-1970)	Jaguar Dealer
or	E.R.A. Reproduction Lever	E.R.A.
Hand Brake Lever Cable	Custom for E.R.A. subframe	E.R.A.
Emergency brake linkage, ERA rear suspension	Custom, by E.R.A.	
Cooling system parts	See http://www.erareplicas.com/fiaman/cooling/hose_interchange.htm for part number applications.	
Water neck/thermostat housing	Ford Motorsport M8592-B302 (angled 30deg up)	
Hoses: Upper	Gates 21178 or equivalent (requires trimming)	Local auto parts store
Lower w/L or R outlet	Gates 20390 or equivalent (See page 34 for trim)	
Bypass	Gates 28466 (5/8" x 5/8"), 28474 (¾" x ¾") or 20662 (5/8" x 3/4")	
Heater	Gates 28472 (to thermostat housing) 5/8" ID straigth hose (~50" to water pump)	
Radiator expansion tank	Harrison 3155416	E.R.A.

Rear suspension	**Jaguar based** or **Custom ERA design** with outboard brakes (FIA only)	
Jaguar Rear Suspension Assembly (Core)	1964-1974 Jaguar XKE, Series 1 or 2 1965-1987 Jaguar XJ-6 (All rear suspension with inboard brakes and tubular lower control arms)	Wrecking yard or E.R.A.
Sub-frame	Custom E.R.A. for Jag based or ERA outboard braked design	E.R.A.
Rebuilding Parts for rear suspension	Bearings, brake parts, etc., see page 135	SICP, E.R.A., Jag Dealer
Coil-over dampers	See length specifications on page 48.	
Standard XKE W/O height adjustment	Spax S 200/415 (Externally adjustable damping)	E.R.A.(Jag rear)
Height adjustable	Spax G640 S200	E.R.A.
Coil Spring (4 rqd) - std Spax Spax with height adjustment	10" x 350 lbs/in 8" x 350 lbs/in	E.R.A., Carrera, Dillon, AFFCO, Eibach
ERA Desgign		See specs on page 37
Damper	Spax G452-AS200	
Spring	9” x 2.25”ID x 400 lbs/in	
Differential/LSD rebuilding	Various ratios of Dana 44 gears	Reider Racing/Michigan Driveline
Spare Tire	Space Saver w/ 4 3/4" bolt circle (Bolt-on wheels only)	G.M. cars
Speedo cable drive ***Richmond Gear***	***See notes on page 12 and 14 for gears*** **Cable**: Champ 400020 **Adapter**: GM 345212 **O Ring**: 7/8"OD x 5/8"ID **Retainer:** 3708148 **Drive gear:** GM 39879XX where XX=number of teeth	E.R.A., dealer, auto parts store
Speedo cable, drive gears, etc.	***See calculation and part numberss on page14.***	E.R.A., Dan Williams
Top Loader, T-5, Tremec		
Cable	AC 11589234 (’67 Mustang)	
Speedo drive gear	C4DZ-17285A (LH, 7 tooth, black) C8AZ-17285A (RH, 7 tooth, yellow)	Ford dealer
Speedo driven gears	See page 14.	
Retaining clip	C1DZ-17292A	

Steering gear	Flaming River 1502-3X3 (Must be modified. See page 43.)	Flaming River E.R.A for modified gear.
Mounting bushings for above	Flaming River FR1600 or Energy Suspension 4.10101	
Steering column, upper	E.R.A. Reproduction or Triumph Spitfire, GT-6 (1972-mid 1977)	E.R.A., wrecking yard
Steering wheel	Moto-Lita	E.R.A.
Wheel hub-Triumph column	Moto-Lita (wheel must be drilled for pattern)	E.R.A.
E.R.A. column	Comes with E.R.A. column	
Steering wheel Center button	Reproduction of original either "AC" or "Cobra" motif	E.R.A.

Transmission: **See notes on page10.**	Ford Top Loader	Dan Williams, GT Performance
	T-5, Tremec	Mustangs Unlimited, GT Performance
	Richmond Gear 5-spd	E.R.A., Richmond Gear
Mounts:		
Ford Top-loader w/ 2 holes along longitudinal centerline or 2 holes perpendicular to centerline 5.6" apart	Ford C8ZZ-6068 A, or Republic 31-2284	Ford dealer, E.R.A., Mustangs Unlimited, auto parts supplier
Ford C-6 Automatic	Ford C9AZ-6068H, or Republic 31-2375	" "
Ford T-5.	Ford C8ZZ-6068 A, or Republic 31-2284	" "
Richmond Gear, Tremec 5 speed	Pioneer 622378 (72-73 Camaro w/MT) Tremecs require an adapter from E.R.A. to use the Pioneer 622378.	Auto parts supplier
Throw-out fork	Ford C8OZ-7515D (must be narrowed for all but big spline Top Loader)	Dealer, E.R.A.
Pivot bracket for above	Ford C8AZ-7522B	Dealer, E.R.A.
Shift Linkage (4-spd. Top-loader)	Original Ford unit, Hurst or other after-market units	Mid-sixties Ford
Richmond Gear 5 speed	Long or Hurst	E.R.A.
Shift Lever: duplicates original	To adapt to all transmissions	E.R.A., 1965-67 Mustang and some other Ford cars of this period
Voltage Regulator	Ford Regulator D4TZ-10316 A, D9PZ-10316 A or aftermarket equivalent for 1967-on Ford alternator with external regulator.	Ford dealer, E.R.A. has electronic regulators with the sam cover that the mechanical regulator (NLA) used.
Windshield Wipers		
Motor and Drive Parts	From 1969-1976 Triumph Spitfire, GT-6 or TR-6	E.R.A.
Arms	Lucas BHA-520l	E.R.A., Lucas parts dealer
Blades	Lucas GWB-164	E.R.A.,
Chrome Bezels (Bush Kit)	Lucas 60600 429	E.R.A., Lucas parts dealer

Wheels:		
Bolt-on	American Racing Torq-Thrust, 15" x 7", 15" x 8.5" For 12" brakes, see notes on page 16.	Summit Racing, others
Pin-drive	7½ x 15 and 9½ x 15 Various widths in 17"	E.R.A., PS Engineering, Trigo, Vintage Wheels
Spare Tire/Wheel (Bolt-on)	GM (Camaro) space saver *See note on page 126.	

SUPPLIES NEEDED

The following list covers most of the materials you will need to complete your kit.

Items marked with an * are not needed if you ordered the "bond body" option.

***Caulking to seal body and floors to chassis**	Urethane or Silicone, 5 cartridges min.	For caulking gun
***Adhesive** for bonding rear body bonding strip	Polyester resins thickened with fillers and binders are available for boat repair	Corvette body repair boat shops and Chevrolet dealers, body shop suppliers or specialty houses Regular polyester body filler and the stronger fiberglass strand fillers such as "Tiger Hair" or "Rot Out" can also be used but these fillers have the disadvantage of setting-up rather quickly making the completion time of the bonding operation critical.
***Blind rivets** Aluminum panels to chassis or fiberglass	(400) 1/8" dia. x .250-.312" material thickness, sealing type, aluminum body/steel mandrel	McMaster Carr 97524A025
Body to chassis	(150) 1/8" dia. x .062"-.125" material thickness, sealing type, aluminum body/aluminum mandrel	McMaster Carr 97524A030
Insulation (foam)	Expanding urethane or DAPtex latex 18826 foam.	Building supply store
Chassis lubricant (grease for universal and ball joints)		
Wheel bearing grease (disc brake high temp. type)		
Weatherstrip adhesive or industrial strengh contact cement		
Foil faced foam or insulation mat'l for tunnel, floor (supplemental)	Frost King duct insulation, FV516	building supply, heating and air conditioning supply, hardware store

SOURCE MASTER LIST

Because of rapid changes in area codes, these phone numbers may be out of date.

BUSINESS NAME	SPECIALTY	ADDRESS
Arthur Allen Mfg. arthurallen.com	Speedo reducers, angle drives	235 E. O'Connor Drive, Elkhorn, WI 53121 (800)683-500
Aviaid Oil Systems aviaid.com	Oil pans and pickups	10041 Canoga Ave., Chatsworth, CA (818)988-8991
Branda Performance cobranda.com	Ford parts	1434 Pleasant Valley Blvd, Altoona, PA 16602, 814-942-1869
Canton Racing Products cantonracing.com	Oil pans and pickups	9 Tipping La., Branford, CT 06405 (203) 481-9460
Carrera Shocks carrerashocks.com	Coil-Over shocks/Springs	5412 New Peach-tree Road, Atlanta, GA 30341 (770)451-8811
Carroll Shelby Ent. carrollshelbyent.com	Engines/parts	19021 S Figueroa St., Gardena, CA 90248 (310)538-2914
Cobra Restorers Ltd. cobrarestorers.com	Reproduction Cobra hardware	3099 Carter Circle, Kennesaw, GA 30144, (770)427-0020
Dan Williams Enterprises toploadertransmissions.com	Transmissions and shifter parts	205 E. Dogwood Dr., Franklin, NC (828)524-9085
David Kee Transmissions 4speedtoploaders.com	Top Loader transmissions, parts	San Antonio, TX (210)967-4161
Ford Motorsport Performance Equipment	Ford parts	44050 N Groesbeck Hwy, Clinton Twp, MI 48036, (810)468-1356
Genesis Performance genesis427.com	Engines and parts	P.O. Box 19449, Indianapolis, IN 46219 (317).357.8767
March Performance Pulleys marchperformance.com	Engine pulleys	32413 Park Lane, Garden City, MI 48135 (888)729-9070
Mustangs Unlimited mustangsunlimited.com	Shelby/Mustang parts	185 Adams St., Manchester, CT 06040 (800)243-7278
National Parts Depot npdlink.com	Ford parts	See web site
PS Engineering	Pin drive wheels	2675 Skypark Dr. #102, Torrance, CA 90506 (310)534-4477
Reider Racing reiderracing.com	Jag differential rebuilding	12351 Universal Dr., Taylor, MI 48180, 800-522-2707
Richmond Gear richmondgear.com	5 speed transmissions	1208 Old Norris Rd., Liberty, SC 29657, 864-843-9231
Speedway Motors speedwaymotors.com	Misc. parts at low prices	300 Van Dorn, PO Box 81906, Lincoln NE (402)323-3200
Summit Racing Equipment summitracing.com	Misc. parts at low prices	580 Kennedy Rd., Akron, OH 44305 (800)230-3030
Trigo, Inc. trigowheels.com	Pin drive wheels	3933 Foothill Blvd, La Cresenta, CA 91011 (818)248-7446
TrueChoice truechoice.com	Racing parts, fire extinguisher systems	40 Industrial Park Place, Powell OH 43026 (800)388-8783

TOOLS NEEDED

Most of the tools required for assembly of the E.R.A. 289FIA are found in the average car person's home workshop.

Major components like the engine and transmission require some specialized tools and skills. If you are not experienced, this may not be a good time for your first project.

Rebuilding the **Jag rear suspension** assembly can be done at home if you are well equipped. A micrometer, dial indicator and standard mechanics tools are required. No matter what your experience, this operation requires a good manual.

Items marked with an * are not needed if you ordered the “bond body” option. We can also cut the side pipe hole for you at the factory.

Socket wrench and sockets

Open-end and box wrenches $^{1}/_{4}$"-1"

Screwdrivers (Phillips and flat bladed) 3 or 4 sizes of each

Jack, preferably a hydraulic floor type

*Caulking gun - (cartridge type)

Small needle nose pliers

Engine hoist or chain-fall

*Pop rivet gun with adapters for $^{1}/_{8}$" rivets

Electric drill with bit assortment

Utility (razor) knife

*Paintbrush 1"-1.5" (buy a cheap natural bristle brush)

Shears or large scissors

Rubber mallet

Saber saw (if you are fitting side pipes)

Socket head (Allen) wrenches

Jack stands (4)

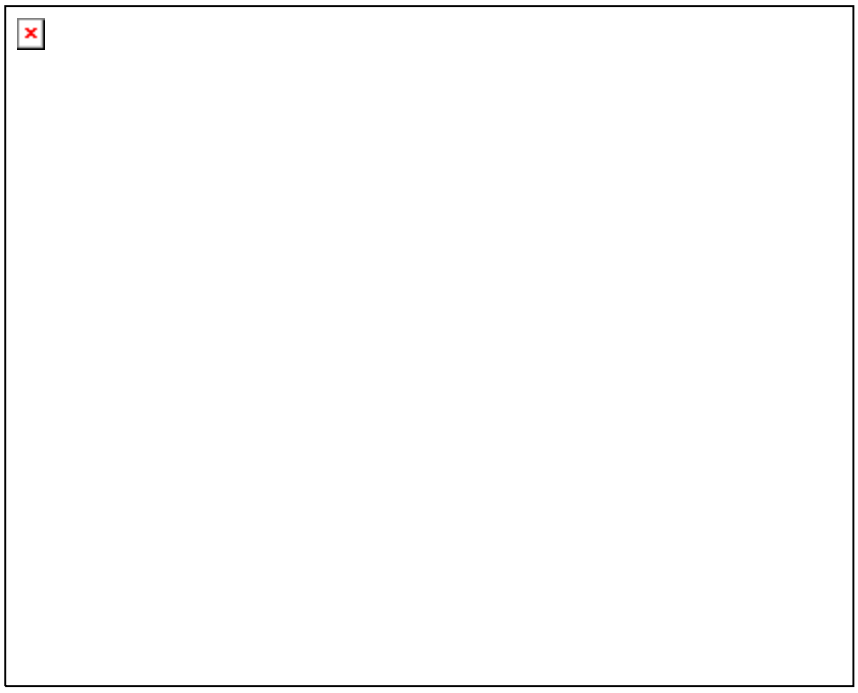
SHIPPING COMPANIES (PARTIAL LIST)

Horseless Carriage
Phone: (800)631-7796

Intercity Lines (our preffered shipper)
Phone: (800)343-0802
Fax: (413)436-9422

SECTION B
PARTS PREPARATION

Restrictions or modifications to the donor parts for the 289FIA and ERA Slabside
This section does not cover engine, transmission or rear suspension rebuilding. Use dedicated rebuilding manuals for your specific equipment.



ENGINE COMPONENTS

*Because of the likely variation of your components, we obviously cannot give engine rebuilding instructions here. What follows are the **E.R.A.-specific requirements** for your engine. General torque specifications for typical fasteners are found on page 138. Good reference books for Ford engines are listed on page 140.*

INTAKE MANIFOLD

If you are going to have a heater, you'll need two tapped holes in the intake manifold or a "T" that will accept both fittings.

289-302 Engine: Most intake manifolds except the very tallest will fit under the hood. If you have a question, please call.

351 Series: Use only medium height intake manifolds.

BASIC PREPARATION

Remove cooling fan from engine water pump pulley.

Install the fitting for the water temperature gage in the intake manifold adjacent to the distributor.. Some **Smiths** temperature gages require a $^{1}/_{2}$"NPT hole. If space permits, you may adapt with a Weatherhead fitting, 3200 x 8 x 6. Otherwise, drill and tap the manifold to $^{1}/_{2}$" NPT. You may remove the heater fitting in the manifold too. Plug the hole.

If necessarey, install aa $^{1}/_{2}$"NPT fitting in the oil pan. Most Canton and Aviad pans already have this fitting.

Install the engine mounts onto the block as shown below.

fia\man\b\engmts

ALTERNATOR MOUNTING:

***Serpentine belt engines** must change to the following components:*

1

980 lower pulley - modify by removing the outside groove.

1980 upper pulley

1979 water pump

The **alternator** pivots in the outer mounting hole in the head as shown below. Some aftermarket heads require a threaded insert (Ford # F4ZZ-6E086-A) to reduce threads to $^{7}/_{16}$"USS. The adjusting bracket between the alternator and the upper right water pump bolt is included in the kit. If you use both spacers, an external brace should be put between the outside end of the alternator mounting bolt and the water pump. Because there are so many possible combinations of water pump, pulley and heads, this brace is not included in the kit. Use a straight-edge to figure what combination of spacers (and possibly washers) will be required for all the pulleys to line up.

fia\man\b\altbrk

Install the long bolt through the (reinforcing bracket), alternator and spacer tube.

Bolt the assembly onto the cylinder head.

Install the top adjusting bracket as shown.

Loosely secure the inner end of the reinforcing strap to the water pump bolt as indicated.

Tighten the alternator pivot bolt.

Tighten the reinforcing strap bolt.

Check the alignment of the pulley grooves with a straight-edge. Add washers or shorten the spacer as needed.

CLUTCH

Install the clutch pilot bearing,, driven disk and pressure plate.

TRANSMISSION

***Note**! After installation, the centerline of the transmission output shaft should be 3.5" +/- 0.25" above the plane of the X member. This will give the correct drive-shaft angles.*

ALL

Install the rear mount onto the transmission.

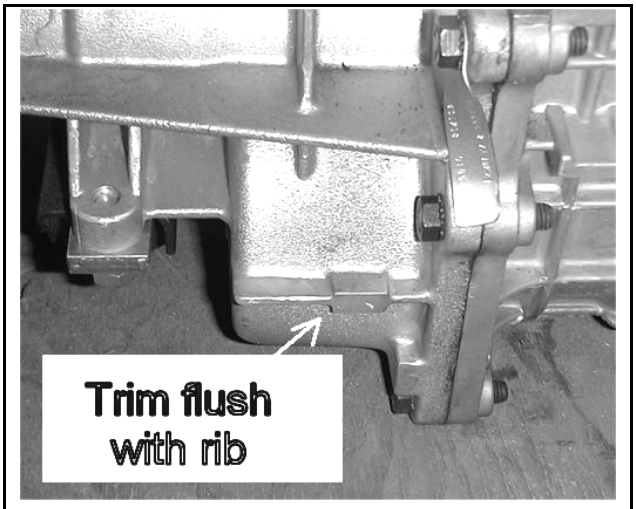
TREMEC

Stock series 600 transmissions have an input shaft that requires a spacer between the transmission and bellhousing. A transmission with a shortened input shaft is available from various sources and obviates the need for the spacer.

The Tremec TKO series have a boss on the right side that must be trimmed back flush with the adjascent rib. See at right. The passenger's side floor may also require some trimming where the transmission comes close.

The TKO 600 shifter can be moved forward from the stock for better positioning:

Some Tremec transmissions require an aluminum adapter between the transmission and the mount. In addition many people prefer to use a concentric throwout bearing with the Tremec. If you do, McLeod (and ERA) recommends that you remove any centrifigul weights from the clutch pressure plate.



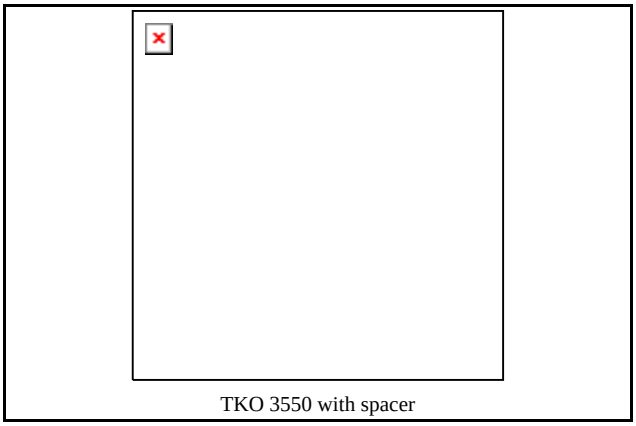
TKO 3550

TKO 500/600

TKO (STANDARD-INPUT) INSTALLATION

Note that the transmission mounting boss is metric-threaded (10 x .1.5) on the inner holes, ½-13 on the outer holes.

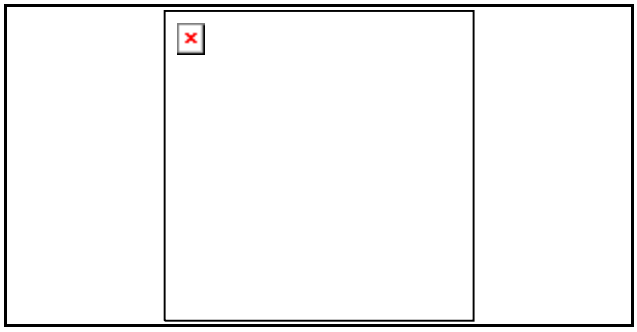
Install the spacer between the mount and the mounting boss. The offset (standard length input shaft) goes toward the rear.



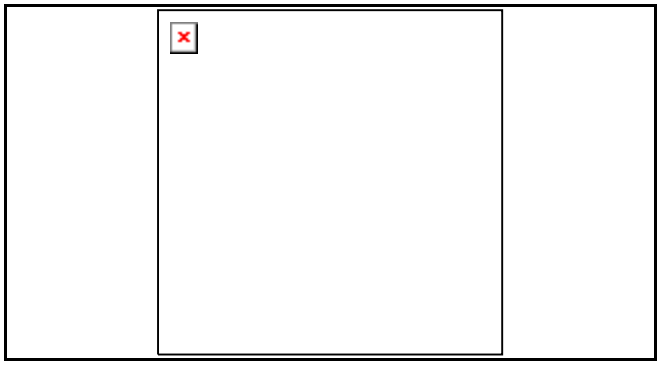
TKO 3550 with spacer

The **500 and 600 with standard** (long) input do not use the spacer. Instead, shims are used between the mount and the chassis. Some of the GM-style mounts may require some trimming on the passenger's side back edge to clear the X member.

SHORT-INPUT TKO – MOUNT MODIFICATIONS AND INSTALLATION



Elongate the holes as shown above. The mount is installed onto the transmission with washers as shown below. Note that the hole-elongation is toward the front.

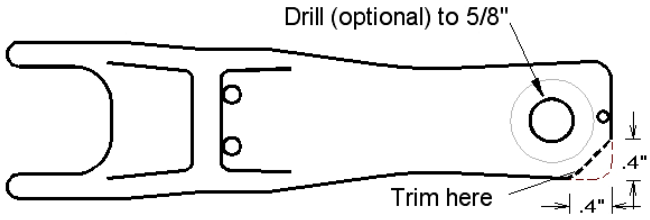


CLUTCH THROW-OUT FORK

We recommend that you use the fork listed on page 24 for all bellhousings. Call us for special instructions for the T-5. See the bell housing notes following.

The standard Ford fork (see page 24 for part number) should be modified as shown.

Drill (remember that the part is hardened) the indentation to $^{5}/_{8}$" id.



Looking at front (convex) side

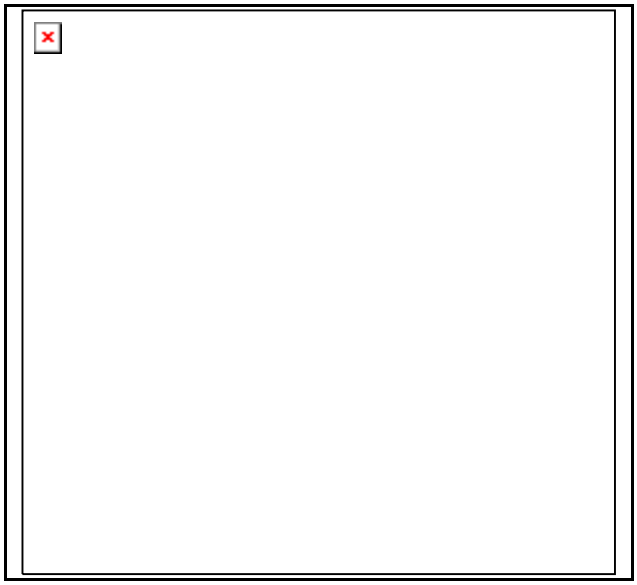
BELL-HOUSING

***Notes**:*

*The bell housing **depth** (face to face) for the **T-5** is about 6.8". If you are using a push-type release lever, the pivot must be spaced about 5/8" forward.*

*The **Tremec** transmission also requires a deep bell housing or a bell housing with a 5/8" spacer for the input shaft not to interfere with the pilot bearing.*

Many blow-shield type bell-housings have a large bottom flange that will extend below the chassis. Trim the engine plate as shown and use it as a template to trim the bell-housing flange. This dimension applies to all engines, although the trimming operation may not be necessary for some.



b\belltrim

The optional E.R.A./Lakewood blow-shield from ERA is already trimmed.

For other engines, trim the bell-housings similarly, using the distance from the centerline of the crankshaft to the bottom edge of the flange.

CLUTCH SLAVE CYLINDER

We recommend the following combinations (with small block Ford) for easiest installation:

T-5, Tremec	Concentric throwout bearing
Top-loader, Richmond Gear 5 spd	External slave cylinder

Details for using the concentric bearing are available from ERA and on the internet. Inquire.

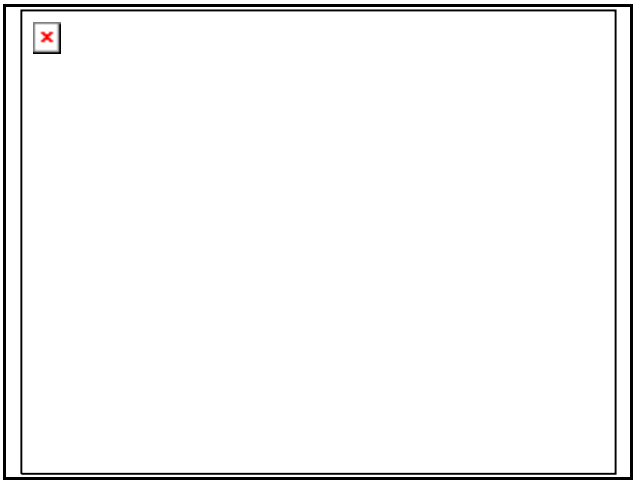
(PUSH TYPE)

See page 124 for hose installation and other details. Part numbers are on page 135.

The bracket and slave cylinder assembly is fastened in three places:

- The tapped hole on the left side of the block bell-housing flange (where the original clutch shaft pivot ball went).
- The rear bolt of the left engine mount..
- The left rear oil pan tapped hole.

Note! When the slave cylinder is installed in the bracket, the bleeder must be at the top.



fia\man\b\clslave1

BLOWSHIELD MOUNT:

Use the appropriate holes to line up the slave cylinder axis with the throwout fork.

CLUTCH THROWOUT ROD

E.R.A. supplies two threaded rods with the push-type slave cylinder to link with the throw-out fork in the bell-housing. If your throw-out lever has a hole in it, use the long threaded rod. If there is just a socket, use the short rod. See page 125 for assembly.

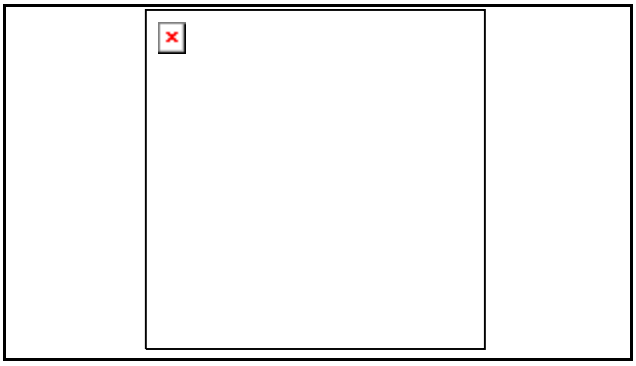
Install the correct link either by shortening the adjustment or loosening the adapter bracket from the block. A return spring is optional.

T-5 -PULL TYPE

Inquire at ERA

SLAVE CYLINDER, INTERNAL

Some clutch/transmission combinations work best with an internal (concentric) clutch slave cylinder. This type of clutch release is self-adjusting, but requires careful initial adjustment to compensate for different clutch finger heights. It is very **sensitive to proper setup**.



We typically use Weber brand, and have found them to be reliable if properly done. When you assemble your car, it is essential to follow the installation guidelines. Pictures and procedures shown here are particular to Weber - yours may be different. Always read and follow the instructions for your installation.

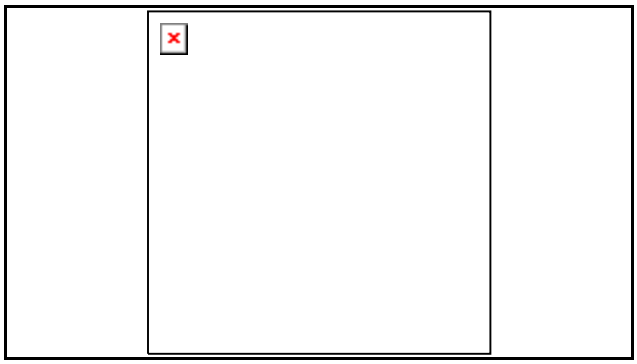
Weber brand cylinders (and most others) have no system to keep the "piston" from being pushed too far out of the cylinder - and puking fluid all over the floor. The ERA requires a pedal stop so that the master cylinder stroke is limited.

NOTE!

McLeod recommends that you remove any centrifigul weights on the clutch pressure plate when you use a concentric throwout bearing.

ADJUSTMENTS

"Permantly" install all the clutch components onto the flywheel, using an alignment tool for the driven disc.



Install the bell housing. Using a straight-edge across the bell housing opening, measure the height of the fingers below the opening. Make sure that the cylinder piston is pushed all the way into the housing.

Adjust the height of the bearing on the transmission by screwing the threaded adjusting sleeve in or out of the slave cylinder so that when the transmission is installed, there will be the indicated clearance.

After the transmission is installed permantly, recheck the clearance and connect the pressure hose to the clutch master cylinder.

Attach the bleed hose to the bellhousing flange at a conveniently accessible location.

OIL PAN:

There are several aftermarket pans and OEM Ford designs listed on page 22. If the pan does not have a oil temperature bung, weld the oil temperature adapter fitting (packed with the auxiliary instrument pieces) onto the left side.

STARTER

Because Ford ringears have several offsets, the starter must be matched correctly. Measure the distance from the plane of the rear face of the engine to the near edge of the ring gear teeth. “A” varies from ¼” to $^{5}/_{8}$”, so you might have to visit your jobber for the correct unit.

A\startoff

THERMOSTAT

If you are using a heater with the configuration shown on page 100, you must drill a small bypass hole in the thermostat next to the bulb so that a small amount of water bypasses constantly. The hole also allows easier bleeding when filling the system.

EXPANSION TANK

FIA

A Harrison unit (part number 3155416) is recommended. An *assembly* consisting of tank, brackets, and original-style clamps is available from E.R.A.

b\exptank

SLABSIDE

Come back when we've figured this out…

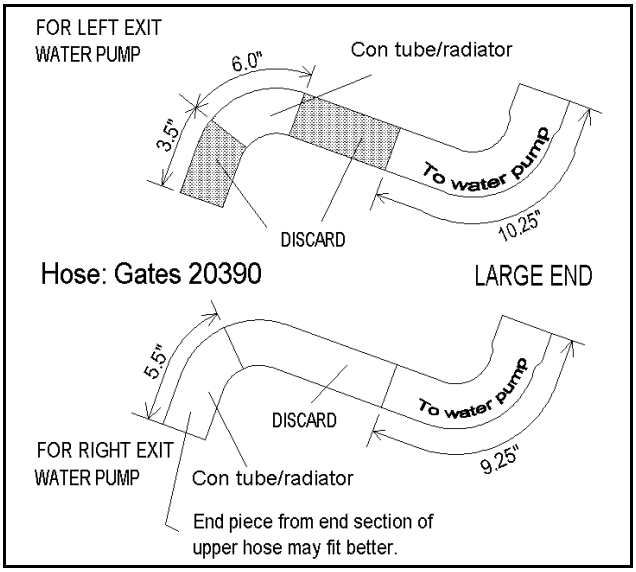
RADIATOR HOSES:

LOWER

A single hose hose can be cut to function as the two connectors used between the radiator and water pump. Cut and trim the hoses as shown, as appropriate for the exit side of your water pump. See page 93 for installation of the hoses.

Note the electrical connection for the fan thermo-switch on the aluminum connector.

Left exit water pump

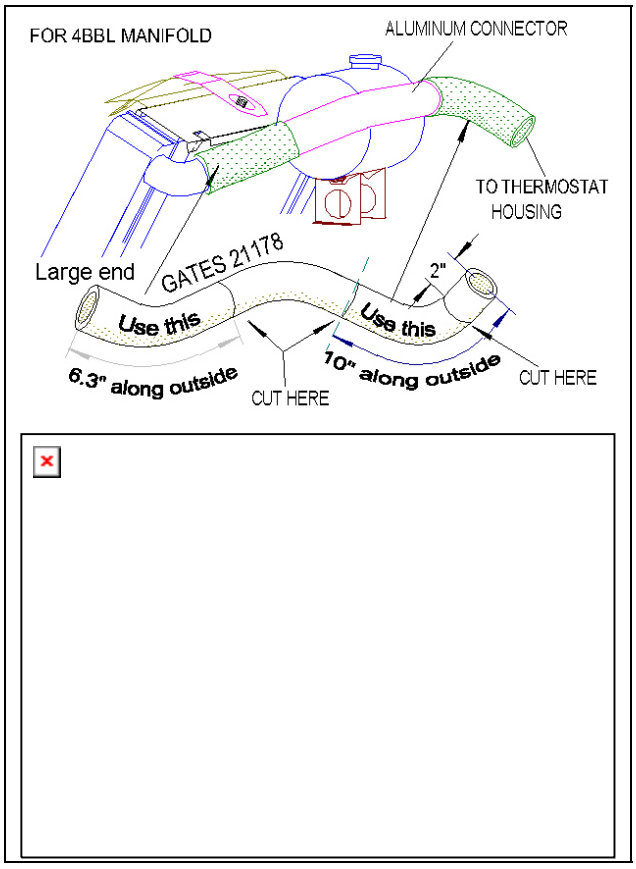


fia\man\b\LWATHOSE

Right exit water pump

UPPER

4 bbl and single outlet Weber manifold



Use a short neck thermostat housing (20° up) on the intake manifold. Cut and trim the hose as shown:

Weber Manifold (two outlets)

Use a drilled freeze plug in the upper hose to restrict flow.

fia\man\b\uwathose2

SMALL HOSES:

If you are not using a heater, connect the water pump inlet to the expansion tank.

REAR SUSPENSION - JAGUAR

DISASSEMBLY

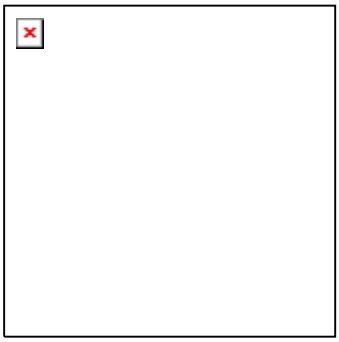
Components must be thoroughly checked and rebuilt if necessary: brake calipers, emergency brake pads and linkage, universal joints on half-shafts, hub carrier and lower control arm bearings. Bearings, etc. are listed on page 135. We have found that the **Spicer®** U-joints listed are the only brand that meets the standards required of the Jaguar half-shafts (and we've tried quite a few).

Replace any corroded or damaged brake lines. Be sure to use lines with the proper end flare and fittings. Note that some British fittings have a convex (bubble) flare that mates with a concave receptacle in the caliper. While this is similar to some metric fittings, the threads are SAE. It is not possible to make these flares with a conventional flaring tool. Aftermarket suppliers and Jaguar dealers have these British style lines.

Mount the brass junction block on the left front of the cage, with the fitting for the flex hose up. If your rear suspension core has the junction block pointing forward, fabricate a small bracket from 1/8" steel strap. Install the hose (mounted on the chassis, originally) onto the junction with a copper "0" ring.

JAGUAR LOWER CONTROL ARM LAYOUT AND PARTS

(Jaguar OEM part numbers



ASSEMBLY

The description below is a supplement to the Jaguar manual, not a substitute. Refer to the Jaguar instructions for a detailed breakdown of the assembly sequence and parts. Call ERA for the complete manual available as a PDF.

*For hints on assembling the **Jaguar hub carriers** (except for the lower pivot) see page.38.*

***Do NOT** replace the control arm roller and needle bearings with aftermarket urethane bushings! **The net result will be wheel hop and generally sloppy handling.** Because we use a subframe there is no comfort advantage to soft bushings either.*

JAGUAR/ERA SUSPENSION SUBFRAME

Build the differential, installing the brake rotors and calipers. **Note**: If you are using the competition 12" vented rotors and aluminum calipers, the rotor and caliper must be installed after the differential is installed in the subframe.

Support the subframe upside down on short pieces of 2x3 wood, etc. with the differential mounting plate down.

Find the brake junction mounting tab on the front of the subframe. See above and on page 75. Insert the differential unit into the subframe without the lower control arm brackets.

Fasten the differential onto the top plate with cap screws and lock washers, leaving the bolts loose.

Loosely install the side brackets onto the differential case.

Slide the fulcrum shafts through the subframe and brackets. Add shims between the brackets and the differential to take up any side clearance. Tighten the bolts holding the brackets to the case.

If there is a gap between the top of the differential and the mounting plate, **shim** to zero clearance.

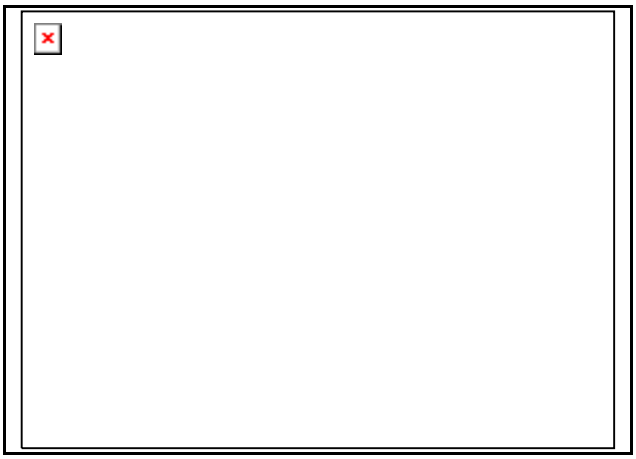
Tighten the top bolts.

On the E.R.A. subframe, toe-in is determined by the location of the holes in the subframe which are not adjustable. If your toe-in is incorrect, your control arms may be bent.

Install the lower control arm with bearings, etc., into the subframe, using the same parts and procedure with the E.R.A. subframe as the Jaguar subframe.

Install the junction block and hose (using a copper washer) onto the bracket on the subframe.

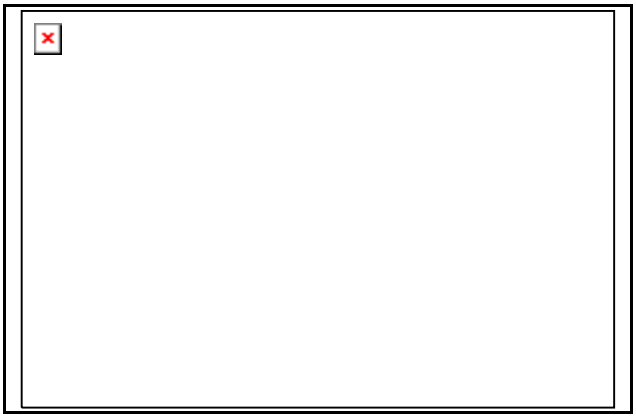
Connect the hard brake lines from the bracket to each caliper.



b\jagcage

HAND-BRAKE LINKAGE

If you have a block on either brake actuating lever (at the caliper), it must be removed. Pry the lever apart to remove, then squeeze together again. Use a $^{3}/_{8}$" bolt at (A), a $^{5}/_{16}$" bolt at (B).



EB_ERA

STIFFER SPRINGS:

You may use slightly stiffer springs in the rear to decrease squat on heavy acceleration.

- If you have stock XKE springs on non-adjustable Jag dampers, you may replace just one stock spring on each side with a 10" long x 350 lb/in spring. If you have the height adjustable Spax dampers, use one 8" x 350lb/in spring spring on each side. All springs are 2 $^{1}/_{2}$" ID.
- Use 300 lb/in rate springs (see length above) if you are replacing all 4 springs.

REAR HUBS

BOLT-ON AND WIRE WHEELS:

XJ sedan rear suspension units with original bolt-on wheels have a flange with a 5 x 4 $^{3}/_{4}$" pattern, matching the front Chevrolet hubs. If you are using an XKE rear drive with splined hubs for wire wheels, they must be changed to the sedan pieces. Call E.R.A. for the hubs. We've got take-offs in stock.

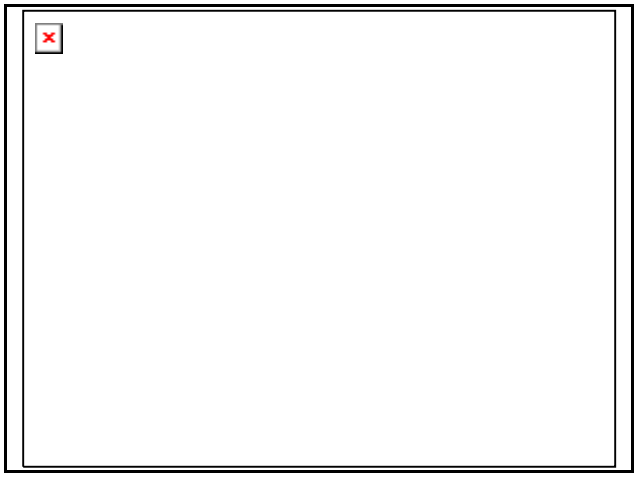
PIN-DRIVE WHEELS:

One piece drive hubs (6 pin) are part of our E.R.A. pin drive option or available separately. They are installed in place of either style Jaguar hub.

TRAILING END ROD ENDS:

Install the trailing arm rod ends onto the lower control arms in place of the original trailing arms. Use the spacers provided to center the rod end on the bolt.

On late rears, the securing bolt enters from the inside of the brackets. On earlier cars the bolts are inserted from the outside (hub side). If the bolt head protrudes from the recess on the control arm, grind it flush with the outer edge of the recess. Otherwise, it will contact the hub carrier.



TRAILARM

Reinstall the hub carrier onto the half shaft and lower control arm. The trailing arms should be installed onto the rod ends when the suspension assembly is installed into the chassis.

See page 138 for lubricants and capacities.

REAR SUSPENSION, E.R.A. (FIA ONLY)

The E.R.A. rear suspension is carried in an aluminum subframe, using a Salisbury differential driving special cast aluminum uprights with outboard brakes. **Most of the axle and bearing parts are Jaguar.** Brake calipers are late model Corvette. Rotors are Wilwood on E.R.A. adapters.

The subframe is mounted to the chassis at the top and at the cross-member through urethane bushings.

Replacement parts are listed on page 135.

You will need the following parts for a complete assembly:

Qt.	Description	Part number
1	E.R.A. conversion assembly, with subframe, lower radius arms, upper and lower trailing arms, hub carrier, all bushings, axle spacers, and all rod ends and fasteners. Also included: brake hat, rotor **Optional**: Emergency brake cables with balance assembly.	
2	Coil-over dampers (Carrera requires coil conversion kit) 14.5" extended length, 10.5" compressed length	Carrera 3356 or 3257 Koni: Ask Spax: G452-AS200
2	Springs	9"L x 2.25" ID, 400lb/in.
1	Differential, w/o brakes	
2	Stub axle w/washer and nut	
2	Axle flange, bolt-on pin drive	Jag CBC1784 E.R.A.
2	Bearings and seals, hub carrier	See page 135.
	Half-shafts and U-joints	See page 42.
2	Brake caliper	

ASSEMBLY

AXLE ASSEMBLY

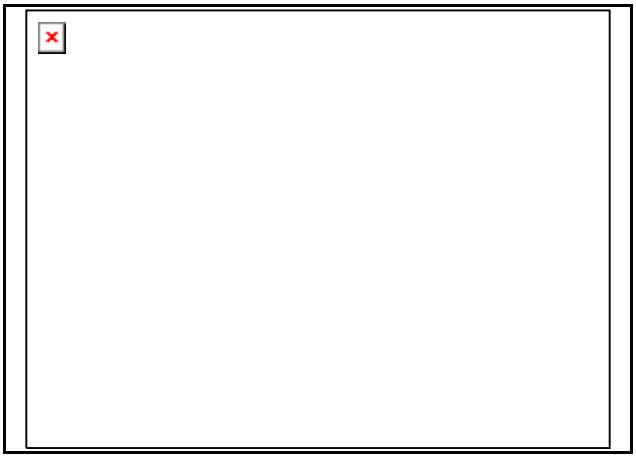
The stock Jaguar XJ inner axle must be shortened to XKE Series I/II length. Alternately, you may build the axle from scratch. Specifications are available from us. Complete assemblies and parts are available from E.R.A.

Clean and deburr the axle splines.

Assemble the stub and inner axle together, replacing the universal joints with genuine Spicer units (5-160X).

Hub Carrier

Note that the lower pivot shaft is a **shrink fit** into the aluminum casting. It may be removed by heating the assembly or, less preferably, by using a press. Generally, removal is not necessary.



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Clean the hub carrier casting of any machining debris, especially on the inside.

Press the inner and outer bearing races and outer seal only into the carrier.

Install the seal race and the outer bearing onto the hub. Make sure that both are completely seated.

Install the seal race onto the stub axle.

ADJUSTING HUB END FLOAT

When the hub carrier is assembled, the end float of the axle/bearing assembly should be adjusted with shims to between .002" preload and .004" float. Aim for zero. You can change the end float with the correct size of spacer from Jaguar, SICP, Concours West, or E.R.A. See the list of available shims below.

Pack the inner and outer bearings with good wheel bearing grease. Also fill (about half-way) the cavity in the hub carrier. Install the inner oil seal.

Technique One

Insert the hub with outer bearing into the hub carrier.

Moderately press the outer bearing onto the small end of the hub so that the bearing seats into the bearing cup. Check that there is no axial play of the hub, but it still rotates freely.

Measure the distance from the hub end to the bearing surface with an accurate dial indicator.

Find the next size larger spacer in the chart.

Assemble the spacer onto the stub axle, install the axle assembly into the hub, lining up the cotter pin holes in each. Install a flat washer and nut. Tighten the nut to 140 lb-ft.

Check the end-play with a dial indicator. If it is correct, tighten the nut to the next near hole and install the cotter pin.

Available shims:

Jag part #	Thickness
CAC3818/10	0.110"
CAC3818/12	0.112"
CAC3818/14	0.114"
CAC3818/16	0.116"
CAC3818/18	0.118"
CAC3818/20	0.120"
CAC3818/22	0.122"
CAC3818/24	0.124"
CAC3818/26	0.126"
CAC3818/28	0.128"
CAC3818/30	0.130"
CAC3818/32	0.132"
CAC3818/34	0.134"
CAC3818/36	0.136"
CAC3818/38	0.138"

Technique Two

Hold the hub carrier vertically in a vise with the inner end of the hub uppermost. Place the special collar tool (Jag tool No. J15) on the hub end. Place the inner bearing inner race on the hub and press the race onto the hub until the inner face is flush with the special collar. This will provide end flat bearings. The end float should then be measured with a dial test indicator. A spacer should then be fitted in place of the Special collar to give end float of .002"-006". Spacers are supplied in the thicknesses shown below.

For example, assume the end float measured to be .025". Subtract the nominal end float of .004" from the measured end float giving .021". Since the Special Collar is .150" thick, the thickness of the spacer to be fitted will be 0.150"- 0.021" i.e. .129". The nearest spacer is 0.128" or 0.130". For competition, use the spacer yielding more end float.

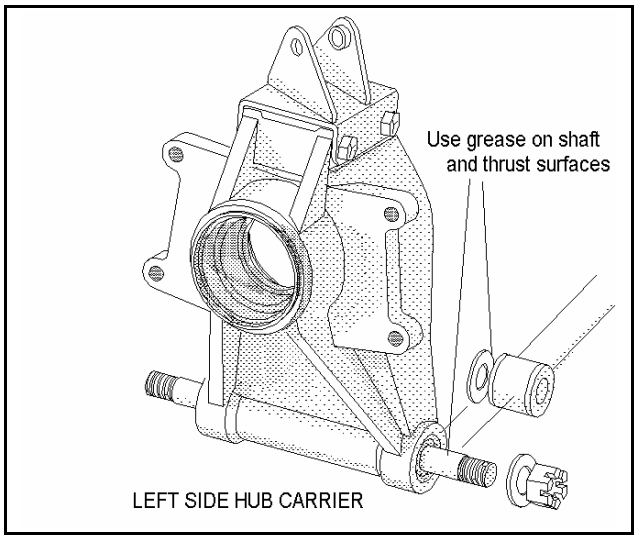
When the axle shaft has been fitted and nut tightened (140 lb.ft.), check the end float with a dial indicator. If it is correct, tighten the nut to the next near hole and install the cotter pin.

Install both the seals into the hub carrier.

Re-assemble the hub carrier with hub and axle.

Install the washer and retaining nut. Tighten the nut to 225 lbft. Without an air wrench, you may want to wait until the car is on the ground for final torqueing.

Install the upper bracket onto each hub carrier and torque the bolts to 75 lb-ft. Note the orientation below for the left hub carrier. The right is the mirror image.



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ASSEMBLY INTO SUBFRAME

Rebuild the differential as necessary. Some units have a separate caliper mounting bridge on the side bearing housing. This bracket and the original Jaguar rotor can be left off.

Place the differential on the bench, right-side-up. Allow the snout to extend over the edge of the bench several inches. Raise the back up about ¾" with a block of wood, etc. Loop the front of the subframe over the nose of the differential. *Loosely* bolt the top of the subframe to the top of the differential with (4) ½"USS x 1¼"L bolts, flat washers and lock washers.

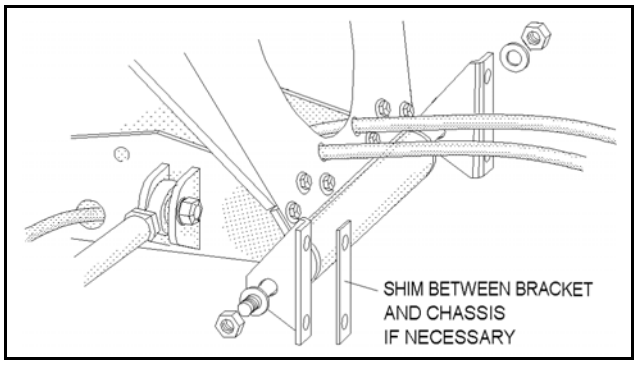
Turn the assembly upside-down. Install the **bottom** section of the subframe by inserting the *rear ears* just in front of the rear flanges of the top. Rotate down in the front to match the front holes and loosely attach the front with 5/16"USS x 3/4"L hex cap screws and flat washers. Align the rear flanges of the upper and lower sections with the 5/8" lower radius arm bolts. Insert the 5/16"USS x 3/4" bolts (flat washers on both sides) and secure with stover nuts.

Use Grade 5 torque specs on page 138 for all fasteners

Loosely fasten the bottom of the subframe to the differential using 1/2"USS x 1 1/4" bolts, flat and lock washers. Shims may be necessary between the channel and the casting, so don't tighten the bolts yet.

Tighten (in sequence) the top differential bolts, the bolts between the top and bottom subframe pieces. If the clearance between the differential and the bottom section of the subframe is greater than .040", insert shims to fill the gap. Use a medium grade threadlocker on the bolts.

Install the bushings and side brackets on the front mount tube. Tighten one castle nut to 5 lb-ft and back off so that the slot aligns with the nearest hole in the shaft. Tighten the second nut to 15 lb-ft and back off to the nearest hole.



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CONTROL ARMS

Install a male (right-hand-thread) rod end onto each front lower radius arm so that the bushing center to rod end center distance is 16". Leave the jam nuts loose.

Install the steel brake lines onto the subframe.

Install the front lower radius arms onto the lower differential bracket as shown, leaving the inner bolt loose.

Install the coil-over damper onto the upper mount using a 1/2" x 2 3/4"L bolt with flat washers and stover nut. Install the coil-over onto the lower arm (spacers, too), tightening the top and bottom bolts.

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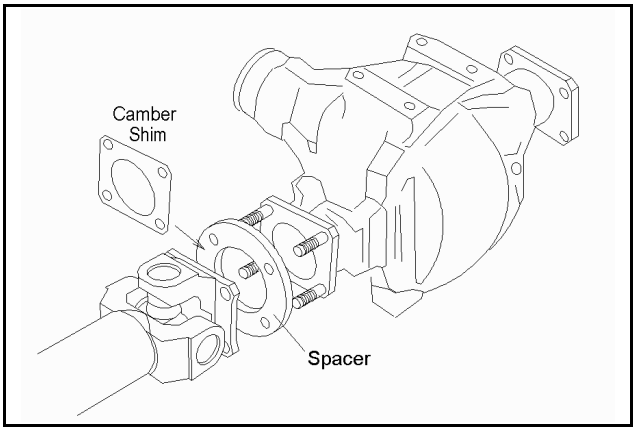
Insert the thrust washers and inner bushings into the hub carrier assembly. Lightly lubricate the inside with heavy grease (silicone or moly base is best). Install the hub carrier onto the front radius arm. Loosely install the second bush half, washer and castle nut.

Install the rear radius arm onto the hub carrier in the same manner. Slide the other (inside) end into the bracket on the subframe and temporarily secure with a bolt. Insert the 3/8"-16 x 5/8"L bolts through the connecting plates. Tighten each castle nut to 15 lb-ft and back off to the nearest hole. Secure with a cotter pin.



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Bolt the half-shaft inner ends and spacer onto each differential output flange. If you wish, install Jaguar shims with about .060" total thickness between the half-shaft and the spacer. This will make minor camber adjustments easier after basic alignment has been done.

Slide the axle into the hub carrier, using a small amount of light grease on the splines. For competition, you might want to use a little shaft-and-bearing mount on the splines, but be aware that disassembly requires heat. Secure with a flat washer and castle nut.

Tighten all the lower hub carrier pivot shaft nuts to 20 lbft, back off $^{1}/_{3}$ of a turn to the nearest cotter pin hole and insert cotter pin. Insert any shim washers necessary between the rear flank of the rod ends and the cage bracket. Install a flat washer and lock nut.

Install the caliper using M10 x 30 allen screws and ribbed lock washers.

Install the upper trailing arm bracket with bolts, flat washers and lock nuts so that the bracket angles in toward the front.

Install the upper trailing arms onto the hub carrier bracket.

Install the lower trailing arm onto the lower radius arm with flat washers and lock nut. Tighten nut to 35 lbft. The front of the trailing arm is attached the same as the Jag suspension.

EMERGENCY BRAKE CABLE

Route the long cables through the hole in the subframe as shown above. Pass it through the internal holes, the holes above the front mount (page 40), and into the balance bar shown on page 37. If you supplied the calipers, cut a slot in the cable mount big enough for the cable to fit through.

ANTI-SWAY BAR

Install onto the rear of the subframe with $^{5}/_{16}$"-USS nuts, flat and lock washers as illustrated.

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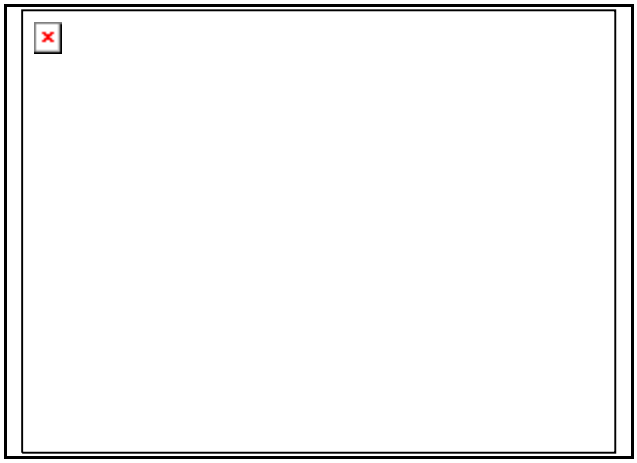
SHIFT HANDLE

Handles are available from E.R.A. and Finish Line



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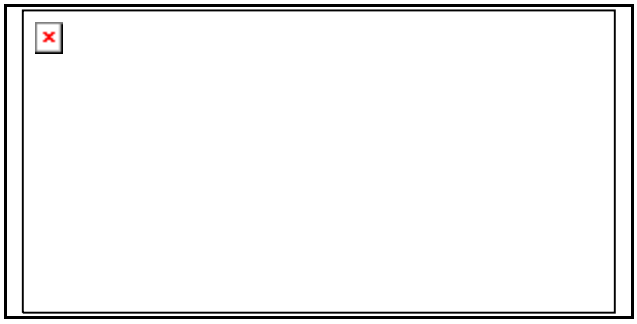
SHIFT LINKAGE

*E.R.A. has complete **linkage** and **adapters for Hurst linkage** for those who don't want to do the modifications required. Inquire for details.*



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TREMEC 5 SPEED TRANSMISSIONS

All Tremecs except for the 500 and 600 retain the stock shifter location. On the 500 and 600, the rear plate can be turned 180 degrees, moving the lever about 3” forward.

DRIVESHAFT

E.R.A. stocks drive shafts for most Top Loader, Tremec and Richmond Gear transmissions. You may have a shop specializing in power transmission equipment make one to your specifications. You must supply them with the Ford transmission slip yoke and the distance from the differential flange to the tail shaft of the transmission.

Measure and check the distance from the face of the differential flange to the end of the transmission, including the seal extension. Subtract about $^{3}/_{4}$" for movement (note that some seals are accordion-like and designed to ride against the flange of the output yoke).

Drawings for the units E.R.A. supplies are available from E.R.A. Inquire.

STEERING GEAR

See page 24 for part numbers.

The E.R.A. supplied steering gear does not require the preparation below

Start with a Flaming River 1502-3X3 gear.

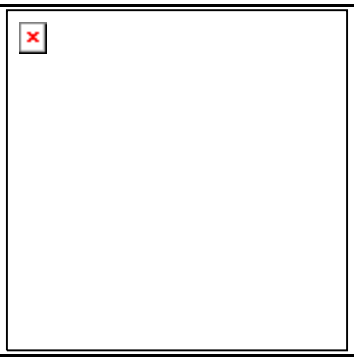
Remove both end boots.

Trim off the threaded end as shown.

Weld on the new E.R.A. tie rod adapter (optional).

Paint the tie-rod and replace the rubber boots, securing with plastic tie-wraps or narrow metal straps. Leave the tie-wraps slightly loose until the toe-in is adjusted.

Install mounting bushings.

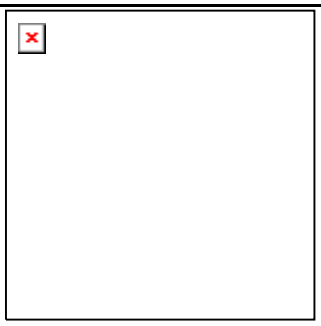


STEERING COLUMN (UPPER)

You may use the E.R.A. reproduction column or the Triumph column listed on page 16.

BUSHING REPLACEMENT (EARLY)

(Based on a Triumph Spitfire bushing)



The bushing consists of two parts: an outer rubber/steel insulator and a nylon sleeve.

- Make sure that the nylon sleeve is seated inside the insulator.
- Put a little grease on the inside of the housing to reduce the friction.
- Line up the retaining lugs and the hole, and push the pieces fully home.

Remove the bushing by pushing the lugs in and toward the housing end.

BUSHING REPLACEMENT (LATE)

Part number: Page 136.

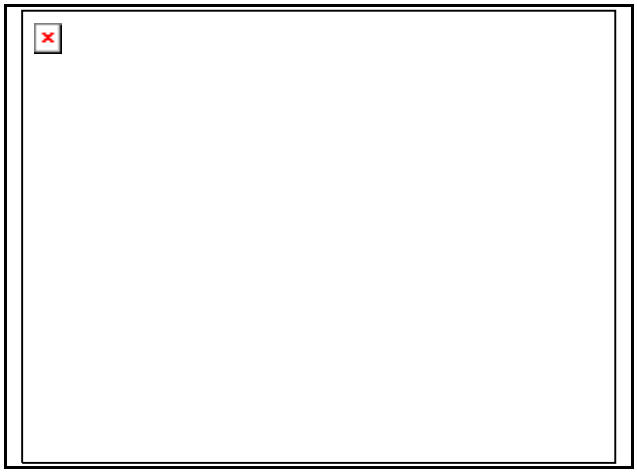
The one-piece nylon bushing is staked into the housing. If the bushing needs replacement, it must be split and pried out. After pressing in the new bushing, it may need reaming or hand fitting. The column should fit with zero clearance or a slight interference.

When inserting the column through the assembly, be very careful that you don't push the sleeve out..

E.R.A. COLUMN

The E.R.A. column is ready for installation. No preparation is necessary.

TRIUMPH COLUMN



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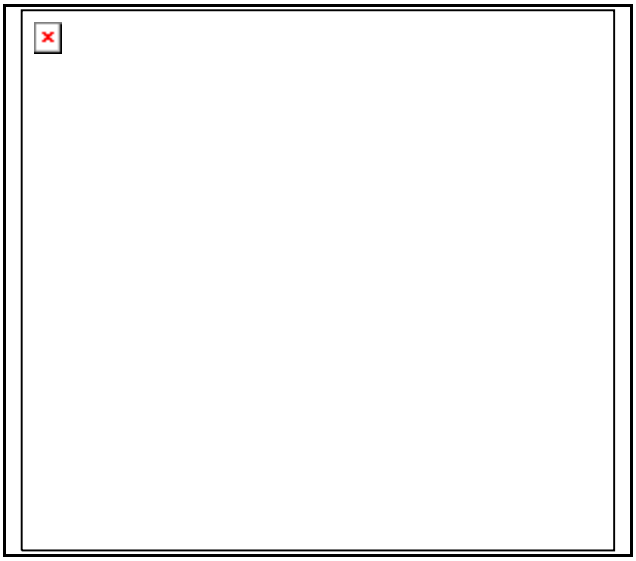
Remove the ignition switch/column lock. Two bolts hold the ignition switch unit onto the column, but their heads automatically snap off in assembly for theft proofing. They now look like large pins or dowels. Use a prick punch and small hammer to turn the bolts out, or cut a slot in them and use a screwdriver.

Replace the bushings if there is any side play in the housing. The column bushings are plastic, in a steel and rubber collar that have 2 nubs that lock into holes in the column housing.

- Remove the horn plate located inside the switch/hub housing by straightening the two metal tabs holding it in place. The plate may be discarded if you are going to use the dash mounted horn button.
- Remove the nylon washer and aluminum cap from the lower end of the column housing.
- Slide the column up and out of the upper (steering wheel) end of the housing as far as it will go.
- Trim most of the old upper and lower bushing nubs off with a razor or utility knife. Work the lower bushing out with a screwdriver by pushing in and down on the locking nubs in the side of the housing.
- Remove the column from the housing.
- Using a dowel just small enough to fit inside the housing, drive the upper bushing out through the upper end of the column from the bottom.
- Replace the upper bushing using the drift you used for removal. Lubricate the outside of the bushing with silicon, waterless hand soap, etc., before pushing into place.
- Slide the column back in place.
- Replace the lower bushing.
- Replace the horn plate if necessary.

Cancelling cam

Before the Triumph steering column can be permanently installed, check that the signal canceling cam on the steering column shaft points toward the left when mated with the steering gear and middle column. Normally the cam will be oriented correctly if the flat on the column (where it mates to the intermediate column) is up.



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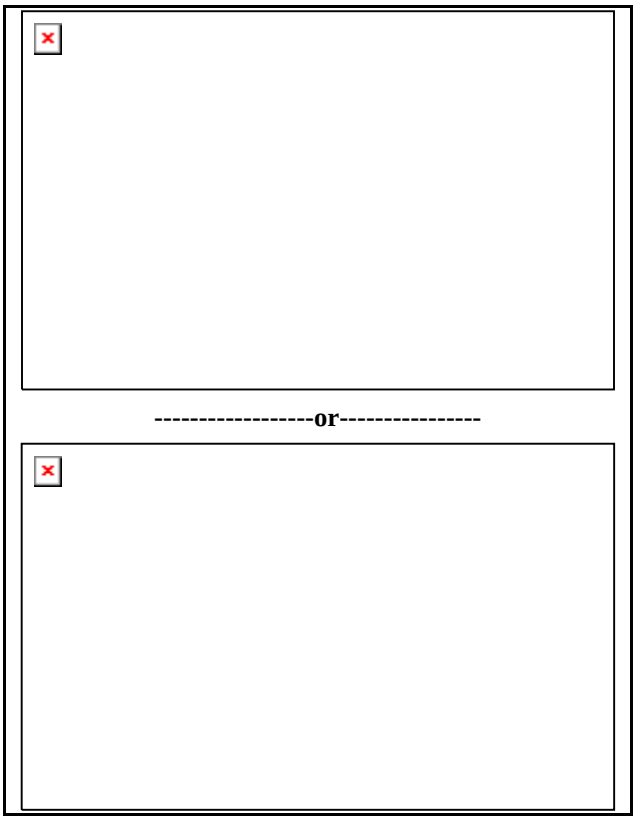
WINDSHIELD WIPERS

Prepare the wiper motor and other components as described on page 46.

INSTALLATION

Before you install the wiper wheelboxes, mock up the assembly off the car to check whether the cable properly engages the drive gear. Tighten the cover against the guide tubes. If the fit is too loose or too tight, bend the guide above the gear up or down as necessary. There are two typical designs that are currently available:

The shaft end-play of the second design can be adjusted by bending the tang on the cover.



----------or----------

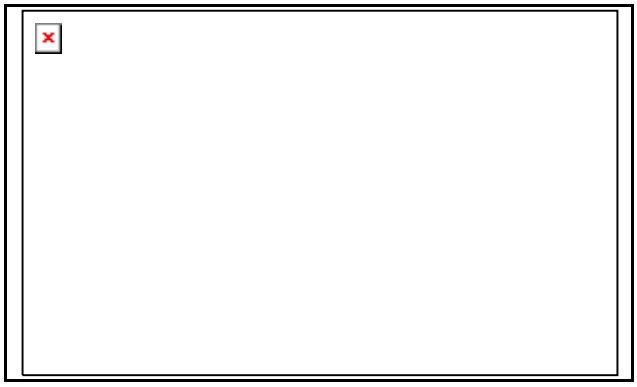
Insert the wiper wheelboxes (up through the holes in the cowl with the cable guides down and forward. It may be necessary to cut about 1/8" from the drive spindle spacer sleeve to compensate for the extra thickness of the fiberglass body. Install the gaskets, bezels and nuts but don't tighten the retaining nuts.

Loosen the nuts holding the cable retaining plates to the wheelboxes.

From the engine side of the firewall, push the tube from the wiper motor to the right wheelbox through the grommet.

For **electrical testing**, see the electrical troubleshooting guide available on the ERA website.

CONNECTING TUBES



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Undo the large nut and remove the cable tube/wheelbox assembly from the motor.

Remove the wheelbox backing plates and disconnect the tubes from the wheelboxes.

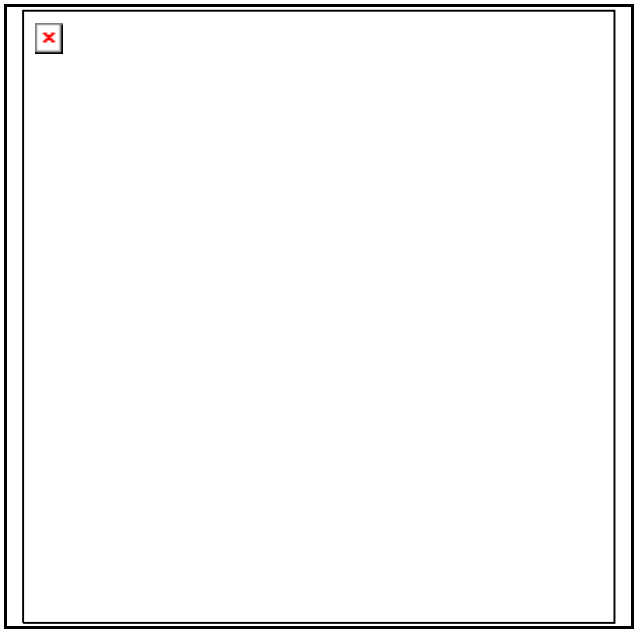
Using a tubing cutter or hacksaw, cut off approximately 2 3/4" from one end of the original tube betwe en the right wheelbox and the motor. Save the nut and the piece of tubing removed.

'I" is now the new tube "C" replacing the original.

Slide the nut onto tube (B) (the shorter of the two supplied and having only one end flared).

Flare the end of the tube with the nut. Slide the drive cable through the tube. If the cable is tight at the new flare, use a 1/4" drill bit to "clean" the inside of the tube.

MOTOR PREPARATION



If you are sure that the wiper motor functions correctly and don't want to disassemble the wiper motor itself, skip steps 4 through 8.

Take out the 4 screws holding the **cover** to the gearbox, and remove the cover.

Remove the **circlip** and **washer** from the connecting rod big end, and remove the connecting rod. Note the bottom washer.

Remove the circlip and washer from the back side of the crankshaft, and push out the crankshaft from the housing. Retain all the parts! Note the **thrust washer** on the inside of the crankpin.

Mark the relative position of the round motor housing to the aluminum gear reduction housing. Remove the two long screws holding the motor housing to the frame. Separate the two (with gentle soft hammer taps if necessary). Do not lose the felt washer and thrust washer in the bearing cup at the bottom of the housing.

Inspect the **brushes** for wear or sticking, the commutator for excess wear and arcing, and the lower bearing. Clean the parts with a solvent if necessary. Work the brushes in and out to insure free motion.

Install the **armature** carefully into the gear housing until it contacts the sides of the brushes. Using a hook shaped wire or other appropriate tool, retract each brush in turn so that the commutator can slide past the edges of both brushes and continue into the gear case

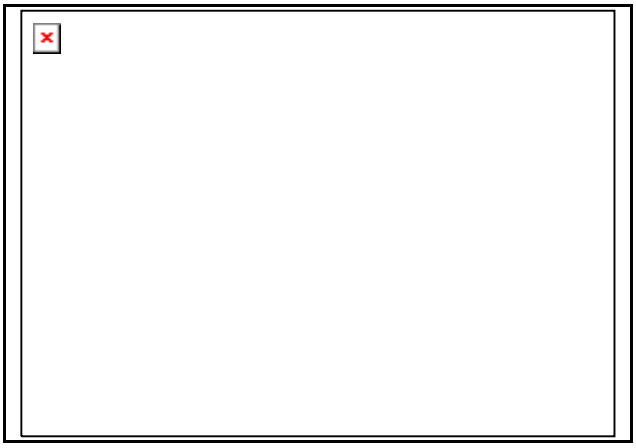
Put 1 or 2 drops of oil in the lower bearing of the armature housing. *Excess* oil will contaminate the brushes later on.

Install the **armature housing**, aligning the marks on the housing and the frame. Reinstall the long retaining screws.

STROKE CHANGES

Remove the plastic gear from the crankshaft by supporting the edge of the gear and tapping the shaft with a soft hammer. Be careful not to damage the circlip groove.

The **position of the crankpin** must be changed in order to increase the stroke of the cable: Punch the underside of the crank plate exactly opposite the center of the crankpin. Use a $^{3}/_{8}$" Blair spotweld cutter or a $^{1}/_{4}$" drill bit to cut the pin from the plate, drilling from the back side, at the punch mark. The pin will be removed, together with a small piece of the plate.



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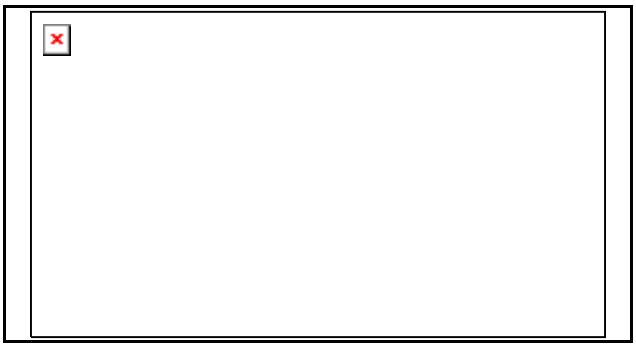
Drill a $^{17}/_{64}$" hole in the opposite side of the crankplate at the position indicated in the illustration. **Countersink** from the crankpin side just enough that the crankpin will be flat on the plate after insertion into the hole.

Weld or braze **the pin** in the new hole from the back. Clean and deburr the crankshaft.

Install the **plastic gear** onto the crankshaft, engaging the tangs of the gear into the crankshaft notches. Note that the plastic cam lobe is opposite the crankpin.



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Grease the shaft lightly, install the conical thrust washer, and insert it into the housing. Install the outer thrust washer and circlip.

Trim the cable so that it measures 38” from crankpin hole to the end. Since the wire material is very hard, it must be done with an abrasive wheel or bolt cutter.

Partially fill the gear housing with grease, and place the cable into the guide. Some guides are integral; others have separate plastic liners. Install the connecting rod with its thrust washers, and the connecting rod circlip.

Install the **cover plate** with 4 screws.

Instructions for wiper installation are on page 97.

DAMPERS AND SPRINGS

Don't panic *if the car seems* ***too high*** *when first lowered to the floor. The car will settle a bit after driving.. The spring specifications below have worked for us consistently, but they may need minor adjustments for lighter or heavier components or your non-standard chassis height preference.*

DAMPERS

The ERA/Jag subframe requires ***XKE series I or II*** *dampers or their dimensional equivalent*

SPECIFICATIONS

Position	Damper Extended Length (eye to eye)	Compressed Length (with rubber compr'sed)	Un-compressed Spring Length (on Spax)	Spring Rate * (lbs/inch)	Eye size Top/Bottom
Front	17.5"	12.1"	12"	250	½"/ ½"
Rear (Jag hub carriers)	13.3"	10.1"	10"	350	7/16"-5/8"
Spax w/o height adj.	13.3"	10.1"	10"	350	7/16"-5/8"
Spax with height adj.	13.3"	10.1"	8"	350	7/16"-5/8"
Rear (E.R.A. carriers)	14.7"	9.4"	9"(2.25" ID)	550	½"/ ½"

*The spring rate is either on a tag or etched on the end of the spring.

If you use a different brand coil-over, do not exceed the extended length by more than 1/4".

FRONT SPRINGS

PRELOAD

Because of small variations in the free length of new springs the installed height in the damper may vary slightly. Use the **preloads** below to calculate the spring installed height.

Measure each spring and subtract the values below for the installed height in a fully extended damper. Drive the car for a short distance to settle the suspension and re-adust as necessary. See page 127.

ENGINE	LEFT	RIGHT
260/289/302		
250lbs/in.	0.5"	0.8"
351C/351W		
275 lbs/in	.5"	.8"

Dimensions above apply to **dampers with the above extended length** only.

REAR SPRINGS

JAG SUSPENSION

You may use stock XKE springs (about 250 lbs/in) for mild street use, but we have found that replacing all four of the springs with 10" x 350 lbs/in ones works better with a high performance engine. **Alternately**, you may replace only two springs with 400 lbs/in ones. If you are using **height adjustable dampers**, the spring must be 8"-9" long (free length). Preload is approximately ¼" for all combinations.

ERA SUSPENSION

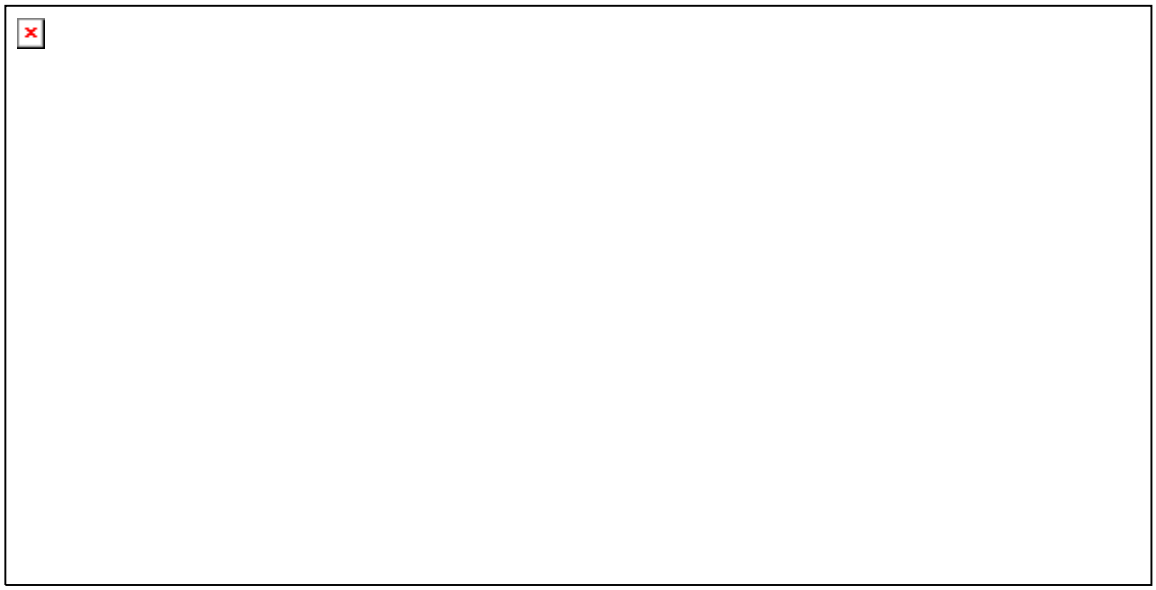
Use 9" x 450 lbs/in springs with **2.25" ID**. The **Preload** is approximately ¼".

REAR HUB ADAPTERS, BOLT-ON WHEELS:

XJ Sedan units with original bolt-on wheels already have the correct flange and are available from us. Most Jaguar **XKE** rear drive units will have splined hubs for knock-off wire wheels. To accept bolt-on wheels, these hubs must be changed to an XJ flange.

SECTION C
CHASSIS PREPARATION

Instructions for disassembly of the kit for chassis painting



BODY REMOVAL:

SPECIAL NOTES

If you have **not** purchased the *Mounted Body* option, the body and most of the aluminum inner panels must be sealed and riveted to the chassis. The kit, as delivered, has the body and inner panels held in place with a limited number of self tapping screws.

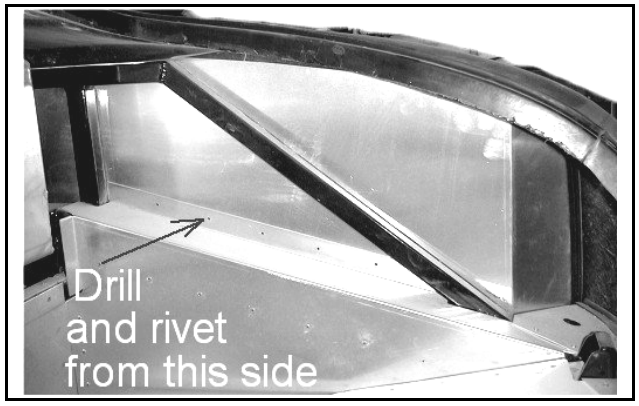
These must be replaced by blind rivets. Almost all the holes are pre-drilled in the aluminum but you will have to complete the drilling into the steel tubing or through a mating aluminum panel.

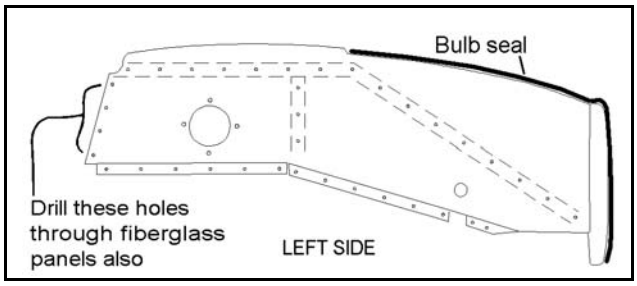
When doing any disassembly, note any adjusting shims and their location. Mark each for reassembly.

DRILL RIVET HOLES

Do before disassembly of the inner panels:

- Firewall panel to the cowl support structure
- Front wheelhouse panels to the chassis
- Steel tube bonded to the hood opening flange
- Rear fiberglass wheelhouse panels (front of rear wheel) to the chassis
- Trunk closing/wheelhouse panels at least to the fiberglass inner body panel. Drill the inner trunk panel into the wheel house panels.





d\rwhlhous

- Rear bulkhead panel to the chassis
- Fiberglass inner body panel and a double row into the fuel tank compartment floor front flange
- Lower flange of the radiator air inlet to the support tube
- Lower trunk opening flange to the rear crossmember
- Inner rocker panels to the floor and door opening flange
- Rocker panels to the brackets on the chassis longitudinals (3 per side)
- Through the aluminum firewall panel into the steel crossbar and fiberglass back panel.
- Remove the aluminum firewall panel. Check panel alignment

Even though the hood, doors and trunk lid are factory aligned, you must **check** their fit with the weatherseals in place before you remove any panels. Minor clearance problems must be corrected before the car is painted.

Hold seals in place with masking tape. If the panels show misalignment, material will have to be removed from the flange on the body, the flange on the door or lid, or both. Use care not to remove too much material from the flanges on the doors or lids. A barrel sander works best for this job. **When disassembling parts,** record the shims between the hinges and body panels.

- Remove the transmission tunnel and the filler at the base of the pedals.
- Remove the inner rocker panels beneath the doors.
- Remove the wheelhouse panels, front and rear, the trunk filler panels at each rear corner.
- Remove the radiator, oil cooler and shrouding,
- Remove the quick jacks or bumpers
- Remove the battery closing panel and battery tray
- Remove the fuel cap and fuel reciever from the tank. Tape over the hole.
- Remove the rear fender stays.
- Remove all the screws holding the body to the rear crossmember, cowl and front support tube. With the assistance of three others, raise the rear of the body first, spreading the sides of the body slide the body up and forward over the cowl.
- Remove the fuel tank and reinstall the fiberglass rear wheelhouse panels. Drill rivet holes through the footboxes into the cowl and chassis rails, through the floors into chassis and portion of wheelhouse panels that run under floors. Remove everything from the chassis.
- The body must be removed to paint the chassis, but is not necessary to remove the body from the chassis to paint the body. All E.R.A. turn-key cars are painted **with the body already bonded to the chassis**, but without mechanicals installed. This requires careful masking to minimize overspray, but guarantees good body panel fit. **Installation of all the mechanical components is easy with the body on the chassis**. It is, in fact, much **harder** to install the body over the mechanical components.

DOORS, ETC.

- Remove the door hinge covers.
- Remove the doors, hood, and trunk lid from their hinges.
- Remove hinges and metal closing panels behind door hinges.
- Remove latching hardware from the main body.
- Remove the aluminum interior panels that are below the door openings.

RADIATOR SHROUDING:

Remove shrouding (3 pcs.) from inside grill opening.

Remove the upper radiator support and support straps from inside the engine compartment. See page 92.

Gently lay the radiator back against the chassis.

DASHBOARD (AND GLOVE BOX):

- Remove steering column, if fit, page 104.
- Remove the 5 chrome screws and trim washers securing the dash panel. If the dashboard wiring is already connected to the main harness, disconnect the multi-plug connectors. Remove the dashboard and store on a soft surface.
- If the car is already assembled, you must also disconnect the air control cables, the water and temperature bulbs, and the oil pressure line going to the cngine. For simpler operations, you can pull the dash rearward without disconnecting those things.

Street Option: Remove the screws securing the glove box to the firewall.

WINDSHIELD:

Don't lose the screws *for the center bracket, windwings or sun visors. They have special British* ***Whitworth*** *threads, and are hand-trimmed to length. You can't get them at your local hardware store (unless you live in England).*

Before removing windshield, mark the location of the center windshield bracket on the body with a sharpened piece of stiff wire or a scribe.

- Remove the two small screws from the windshield post trim plates on both sides of the windshield.
- From under the cowl, remove the 4 bolts holding the windshield to the car, make note of any shims.
- Slide the windshield up and out. Store in a protected place. For installation see page 101.

GAS FILLER CAP

FIA

See the exploded view on page 97.

- Remove the cap and adapter by removing the inner cap and the 6 screws connecting the adapter to the tank.
- Gently rotate and slide the assembly out with body seal (note the orientation). Save the assembly, gasket and screws in a safe place.

SLABSIDE

- Remove the access panel behind the tank.
- Loosen the hose clamps aecuring the hose.
- Rotate the filler to break the seal. The filler pulls straight up.

FUEL TANK

FIA

See the fuel tank notes on page 96.

- Drain the tank. This can be done from the front or under the car at the fuel filter connection.
- Remove the trunk lid and the trunk hinges.
- Remove the front closing panel and the right side filler inside the trunk.
- Remove the access plates at each side panel (inside the rear wheel wells) and remove the nuts securing the strap.
- Remove the mounting pads at the rear bottom edge of the tank.
- Remove the tank by snaking out the left side first.

SLABSIDE

- Drain the tank.. This can be done from the front or under the car at the fuel filter connection.
- Remove the trunk lid and the trunk hinges.
- Remove the back closing panel.
- Disconnect the fuel line at the center of the tank.
- Remove the access plates at each side panel (inside the rear wheel wells) and remove the nuts securing the strap.
- Slide the tank straight back until it clears the support tube, then drop the left side (without the notch) down. The tank can then be rotated up on the other side. It just clears the trunk opening with a little jiggling.

JACK PADS/BUMPERS, BRACKETS

See the illustration on page 111.

- **Front:** Remove both fresh air inlet ducts from the front body.
- Remove each bumper/tube assembly from its mounting bracket. If you have a nudge bar, you may remove the bumpers and nudge bar as a unit.

Rear: Unbolt the bumpers from their mounting brackets. Access for the top bolt is inside the trunk, for the lower bolt from underneath the car. If nudge bar is fitted, remove in unit.

ROLL BAR:

Remove the access panels from the rear bulkhead. See page 92 and 86. Remove the bolts from roll bar, one at each leg, and one at the rear end of the rear brace.

Remove the 4 bolts at the front of the roll bar brace. Slide the hoop up and the brace forward to disengage the upper slip joint.

Unbolt the roll bar hoop from the chassis (2 bolts) and pull up and out.

Remove the rubber grommets from the body.

Locate and remove the screws (save the screws) holding the body to the chassis from the:

- Front inner wheelhouse panel (page 60)

- Bottom edge of the rocker panel (save any shims)
- The interior side of the firewall where the firewall attaches to the steel cross member.
- Trunk floor on the rear chassis crossmember.
- Also remove rear wheelhouse closing panels from inside both rear wheel wells. These panels are the ones that close off the wheel area from the passenger compartment.

FINAL REMOVAL

Two people per side are required to remove or replace the body from the chassis.

Gently spread the body sides out, working over the door hinge mounts. Don't snag the brake line that runs behind the left front inner wheelhouse panel.

After removal, support the body on a flat surface so that there is no stress on the rocker panel area under doors.

CHASSIS PAINT:

If chassis is **not powder coated** from E.R.A. (optional), all the remaining parts on chassis must be removed:

- Brake cylinder cover box and pedal assembly. Cover or remove pedal shaft needle bearings in chassis before priming or sand-blasting chassis. Refer to page 60 for pedal assembly details.
- Floors, foot boxes and brake lines
- Radiator lower support tray. Remove the nuts on the bottom of the front chassis extension. See page 92.

The footboxes, floors, transmission tunnel and rear bulkhead panel are temporarily located and secured with sheet metal screws. Save the screws for use later in aligning parts for installation.

Remove the accelerator pedal assembly, fresh air control valves, brackets, etc. from the foot boxes.

Coat the chassis, brackets, pedals and brake cover, suspension components, etc. It is not necessary to paint the aluminum panels.

- Clean all parts with wax and grease remover.
- Etch metal with "Metal Prep", or by sandblasting.
- Apply a primer coat appropriate for your paint. If possible use non-sanding epoxy primer.
- Paint the chassis and other parts with epoxy or a two-part polyurethane paint such as Dupont Imron or Ditzler Deltron.

When the paint is properly cured, support the chassis on padded jack stands at least 18" off the ground at the rear cross member. This is the minimum height required for installing the rear suspension

SECTION D
BODY/CHASSIS ASSEMBLY

Assembly of the interior panels and mechanical components.

INTERIOR PANELS

FLOORS

(Done with "Bonded body option")

Hold the floor panels in place with the screws used for shipping.

Using the holes in the aluminum for a pattern, drill $^{9}/_{64}$" holes through the chassis rails. Also, drill holes through the flanges where the floor rests on the "X" member. Remove the floors and remove the drilling chips.

Using a caulking gun and high quality auto body seam sealer or a silicone base sealant, run a bead of sealant on all the frame surfaces the floor will contact. Don't skimp, you don't want any gaps where water and dirt can accumulate.

Place floor panels into place and rivet with $^{1}/_{8}$"x $^{3}/_{8}$" aluminum or stainless steel rivets. Press the floor down while riveting to ensure a tight fit.

Check for gaps between the floor and the chassis and fill them with more sealant if necessary. From under the car, smooth out any excess sealant that has squeezed out.

HORNS

Bolt the horns to the front side of the front central tower. See locations on page 71.

BODY MOUNTING

***Preparation Is Everything! Before starting**, have all tools and materials ready and read the text below.*

The body is attached with sealant and rivets.

Lightly sand the mounting surfaces at

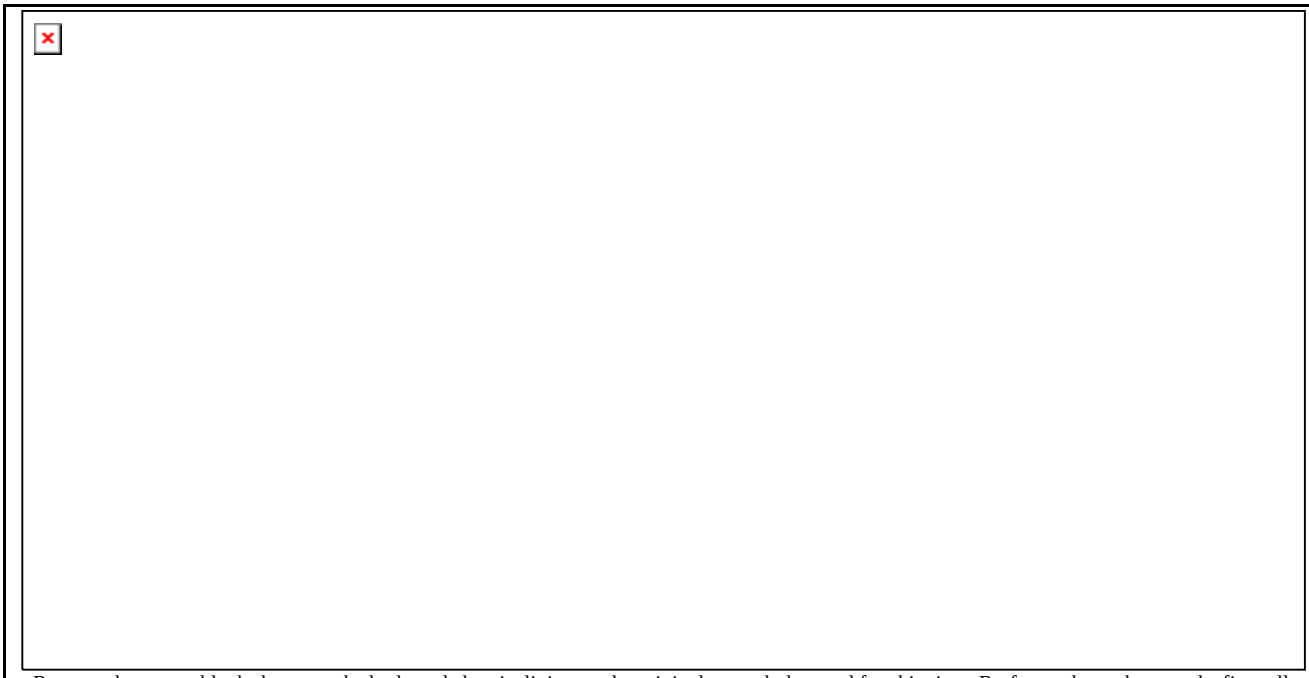
- Cowl sides
- Firewall flange
- Inner rocker panel
- Cockpit back
- Sides of the front cowl inner panel.

With assistance, carefully spread the body sides while slipping the lower body flanges over the door hinge mounts. Lower the body down over the cowl supports and onto the chassis. Watch for the left front brake line that runs behind the wheelhouse panel. Use small blocks of wood, etc. to keep the body at least 3" above the bonding strips and chassis.

Mix a trial batch of bonding adhesive (see Supplies and Materials" on page 25) to check the set-up time before you start. You must have enough time to apply the adhesive and carry out the all the subsequent installation steps before hardening. Use less catalyst or hardener to increase working time.

Use a caulking gun to apply body sealant (also used on the floors and foot boxes) to the chassis and corresponding body parts.

Apply the bonding adhesive between the surfaces indicated on the diagram.



Remove the spacer blocks between the body and chassis, lining up the original screw holes used for shipping. Re-fasten the rocker panels, firewall, and rear crossmember.

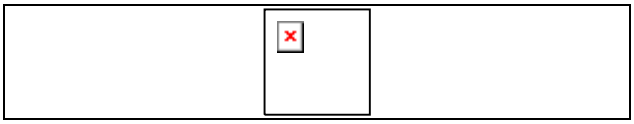
Smooth out any excess sealant, at the same time sealing gaps where water and dirt could accumulate. Wipe off excess bonding material from all joints, and clean up with lacquer thinner or acetone, taking extra care near painted surfaces.

Use $^{1}/_{8}$" aluminum or stainless steel blind rivets to complete the body attachment. Drill $^{9}/_{64}$" holes 3" to 4" apart (most of the aluminum is pre-drilled at intervals) through the following panels and the chassis, and rivet body to the chassis:

- Front inner wheelhouse panels ($^{1}/_{8}$"rivets) and the triangulated sections at the rear of these panels.
- Drill holes (but don't rivet yet) in the rocker panel attachment flanges.
- The firewall where it mounts onto the steel crossmember.
- The overlapping joint between the upper and lower trunk panels.
- The lower trunk panel where it rests on top of the rear crossmember and along the slopped frame rails on each side, $^{9}/_{64}$" holes. Countersink the rivet holes. See above.

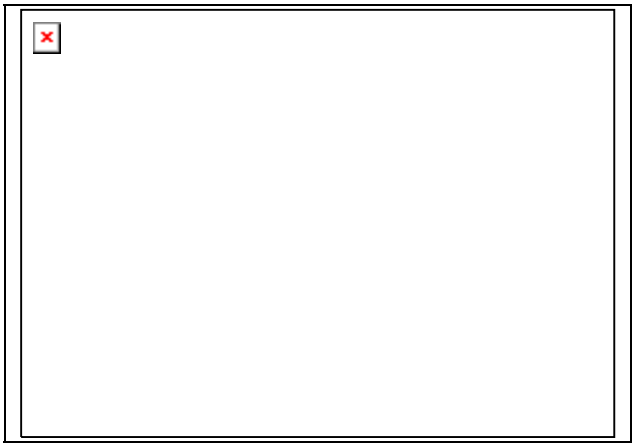
ATTACH UNDER-DOOR FLANGES

If the strips are not already bonded, remove the temporary screws. Reattach the strips with the main body bonding material or silicone, using rivets.. Countersink the holes so that the rivets are flush to the door-opening surface.



ATTACH ROCKER PANELS

Reattach the rockers at the front, middle and rear tabs, using the original shims, etc. For street use, seal the bottom of the rocker with upholstery foam or spray latex (i.e.DAPTex) foam insulation. Once the foam has hardened, trim off the excess. Note that the upholstery foam should be sealed with undercoating or silicone afterward.

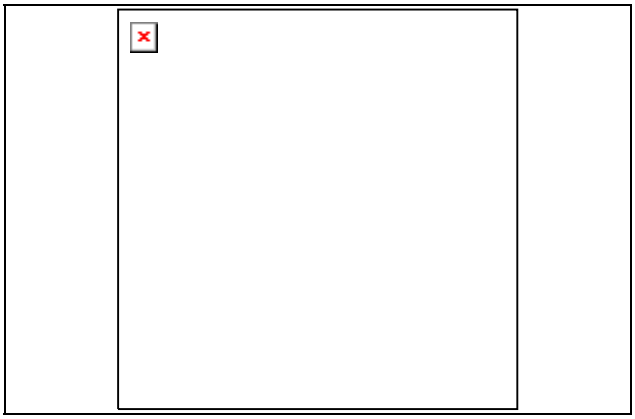


d\rockseal

SEAL - ENGINE COMPARTMENT TO BODY

Before the footboxes are installed, install the fillers between the chassis side boxes and the inside surface of the body side. Once the foam is in place, you can enhance the seal with a little spray undercoating along the front face.

You can also seal any other possible passages with spray latex foam available from a building supply house. (Urethane foam is not recommended. It can distort the fiberglass when it expands.)

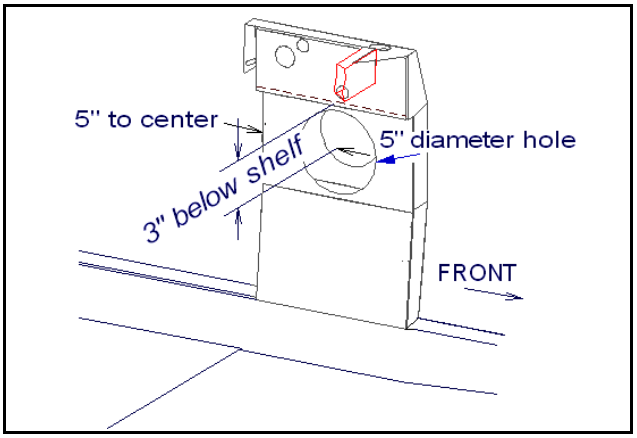


FOOTBOXES

D\footbox

SPEAKER INSTALLATION

For installation of stereo speakers in the sides of the footboxes, holes must be cut into the fiberglass. Note that there is only about 2 ½" depth available for any speakers.



FOOTBOX INSTALLATION

Countersink the rivet holes in the footbox fiberglass along the side and the floor.

RIGHT

Push the box forward into the corner and clamp into place so that the original assembly holes line up. If there are no problems, remove the footbox, apply caulking, and fasten the foot box to the chassis in the same manner as the floors.

LEFT

Lift the footbox up and slip in from the center of the car towards the outside. Don't rivet the area where the foot boxes overlap one another. (The rivets will show in the engine compartment) Just add sealant and rivet the portion against the transverse support tube and the lower rear section that extends towards the transmission. Footbox components

FRESH AIR CONTROL VALVES

d\lvent

(Passenger's side assembly is a mirror image.)

Screw on top of the drivers foot box after putting a bead of caulk on the bottom flange.

Clamp the duct hose in place. The actuating cable will be attached later.

BRAKE AND CLUTCH PEDAL

f\brpedal

INSTALLATION

If necessary, clean and grease the needle bearings in the chassis and in the brake pedal.

Slide the pivot shaft through the chassis bearings with the splined end toward the inside. If the engine is installed, the shaft must be installed from the outside of the chassis.

Install the thrust washer(s) , brake pedal and clutch pedal onto the shaft. Secure the clutch pedal with the shoulder screw.

Install the clutch throw-out arm onto the splined end of the shaft. Orient the throw-out arm approximately opposite the pedal. See the illustration on page 124.

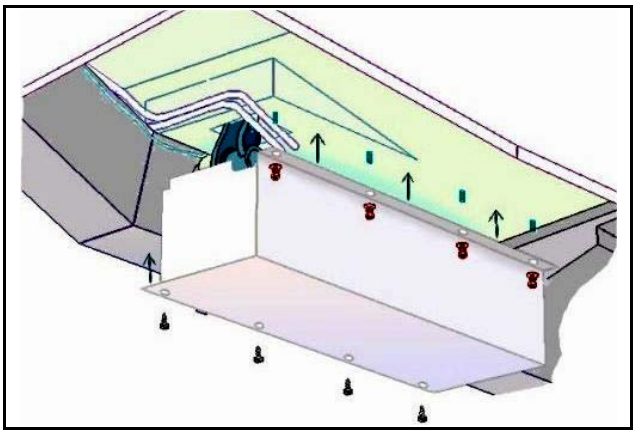
To adjust the orientation of the clutch arm, change the length of the connecting rod between the clutch pedal throw-out arm and the clutch master cylinder:

Remove the retaining clip and the clevis pin.

Loosen the jam nut at the clevis. Turn the threaded rod to change the length as necessary.. When finished, tighten the arm set screw.

For **balance bar** parts installation, see page 130.

Temporarily install the brake master box. It will have to be removed later to connect the brake switch wiring.



FRONT SPLASH PANELS

Reinstall the front panels, using a sealer along the riveted areas and between the rubber edging and the fiberglass fender.

E\fsplash

FRESH AIR INLET DUCTS

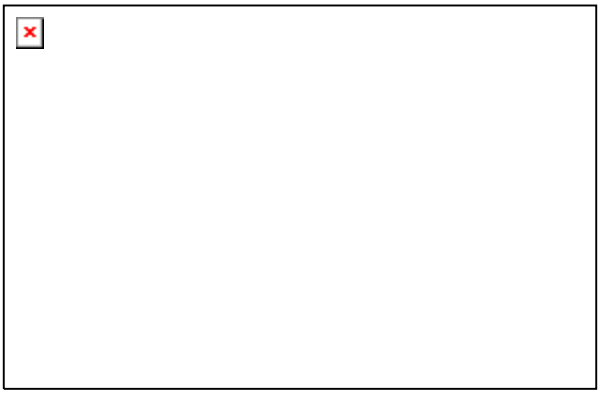
Use the diagram below as a guide for installation.

d\airscup

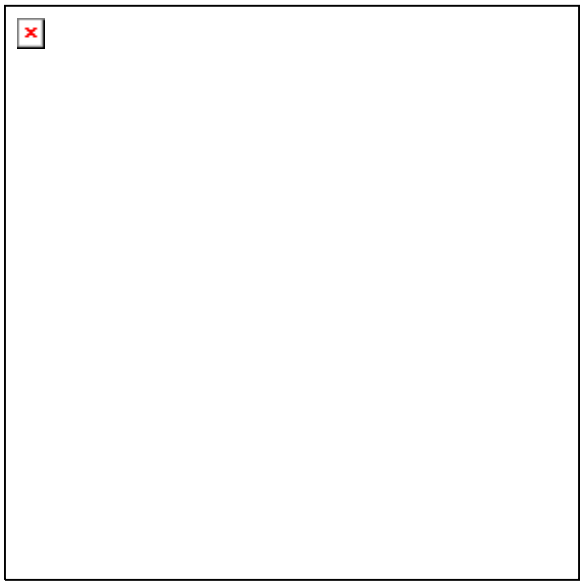
The aluminum inner panel is sandwiched between the scoop and the hose adapter. If you drive where leaves, etc. may accumulate, you may want to put some screen between the scoop and the panel too.

REAR WHEELHOUSE PANELS

***Note**! Countersunk the holes in the rear edge of floor where brake access panel sits, the fuel tank compartment floor into the chassis, the spare tire well thru the rear crossmember and aluminum trunk panels, the aluminum trunk panels to chassis, and the front trunk panel to the trunk lower side panels and steel flange on the 1" steel cross tube. Reinstall the aluminum rear wheelhouse/trunk closing panels and drill holes into the trunk side panel flanges*

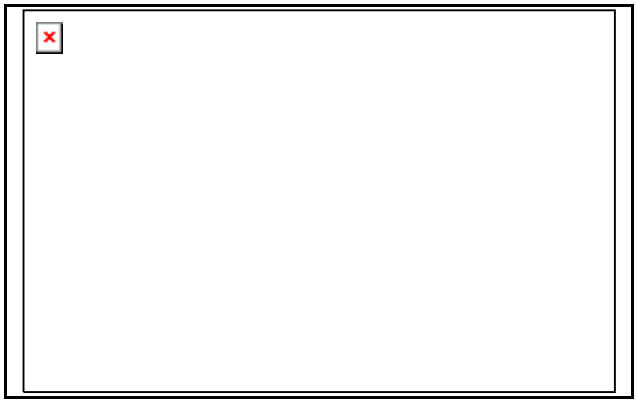


Reattach the rear inner splash panels by riveting and fiberglassing as shown. If there is a large gap along the non-'glassed sections, fill the gap with foam. You can used either foam strips or fill with DAPTex insulation. (See page 25) If you use spray foam, be sure to back up behind the area first. Silicone is then used to do the final sealing between the upper edge and the outside shell.



DETAIL UNDERCOATING

Because our fenders are lined with coremat, it isn't necessary to "protect" the fender areas around the tires, but you may wish to undercoat or paint (flat black) the inside of the fender wells for cosmetic reasons. Use spray or brush-on undercoating to cover all the weather seals. From inside the front and rear wheel wells, brush on a coat of undercoating to seal the seams and the pores in the weather-stripping. Silicone will also seal the seams very effectively.



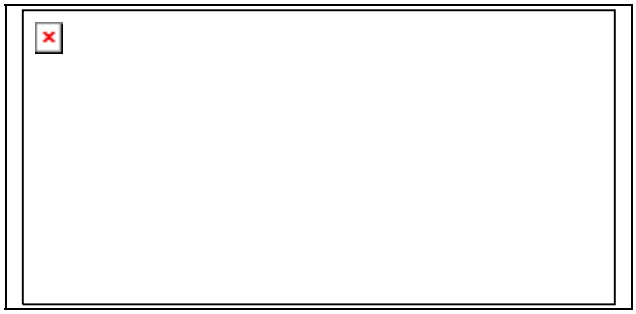
e\caulk

Check the body and chassis seams from underneath and seal openings with either the brush-on undercoating or the caulking used to mount the body. Pay particular attention to the rear closing panels where they overlap onto the upper trunk panel and the junction at the upper front corner of these panels.

If you wish to rust-proof the inside of the chassis main rails, drill holes in the bottom of the chassis at the front and rear of the bottom rails. You may then spray a wax type material into the chassis, even up above the rear suspension. Close the holes with plastic or metal plugs.

FRESH AIR HOSES

Carefully feed the fresh air duct hoses through the holes in the back panel of the front inner wheelhouse panels. Attach to the footbox valves as shown below.



d\freshair

Secure each hose to the adapter with clamps as shown. The rear clamps have speed nuts and are fastened from inside the engine compartment. Connect to the vent valve as shown on page 109.

BODY PREPARATION AND PAINT

The mold seam lines are the only areas that need a light coat of body filler, but the body should be blocked out all over for a show-quality paint job.

Body preparation and painting of FRP is not much different than steel, but it does require the same special skills. If you have no previous experience, it's probably better to have a professional body shop do the work.

While E.R.A. doesn't do the exterior painting in-house, we have found very reliable and competent local companies that do all our turn-key cars at a fair price. Inquire.

COWL EDGES

You may **round the edges of the front and back cowl** to give the original aluminum-wrapped-around-tubes look. Sculpt the existing glass with a grinder or coarse sandpaper.

SPECIAL SLABSIDE HINTS

The rear wheelwell flares are slightly different from side-to-side compared with the longitudinal tire placement. We recommend that the flat area of the right flare be made slightly narrower than the left side (about 3/8”) at the front to keep the wheel centered in the hole.

GENERAL HINTS

The body is easier to prepare if it is mounted on the chassis. On our factory turn-key cars, we always permanently attach the body to the chassis before any body preparation is done. This avoids doing damage to the paint when the body is installed onto the chassis and insures that all body panels match. We do, however, leave the front wheelhouse panels off during the body preparation and painting process to minimize any staining of the aluminum.

Check the fit of the doors and adjust as described on page 89. Leave the hood and trunk panels mounted as well, with small pieces of weatherstripping in place to hold the surfaces at the same position as in a finished car.

- If the body is to be painted on the chassis, **carefully mask** so that overspray is kept off the chassis and mechanical parts.
- Remove any **clay** that remains on the mold break lines.
- Wash the body with **soap and water** to remove any mold release still present, then use **wax and grease remover**.

For the show-quality body, we recommend that the entire body be covered with a thin coat of polyester or epoxy filler. The body can then be blocked out to perfection without using excess primer. **Don't lose the holes** for the tonneau snaps, cowl mirror, defroster vents or windshield center bracket in the process of filling. Once the body is painted, clean out the holes with a $^{9}/_{64}$" drill.

Paint all panels, including the inner frame portions of the doors, hood and trunk lid. We also finish and paint the rough fiberglass underside of the hood. The street option includes a fuzzy liner for the trunk underside.

FIA REAR FENDER PROTECTION

Because the fender extends out from the body somewhat in-line with the front tire, the fender benefits greatly from some kind of chip protection. Use “Chip Guard” under the paint, or apply 3M 84911 film over the paint (Also available in kits as Invinca-Shield). Both are available over the WWW or from body-shop suppliers.

BRAKE SCOOPS

You can lightly sand the inside surface of the fiberglass to duplicate rough aluminum. Paint with satin-finish aluminum color on the inside. The outside can be done in aluminum or matched to the car's color. Installation details are on page 65.

FIA STRIPE STYLE

stripe2

Also shown is the layout of the longitudinal stripess that some have used in conjunction with the side-to-side stripes. See the pictures on our web site for our finished cars.

FIA REAR TRUNK BUNGIE HOLD-DOWN

The washers are placed 2 ¼” below the lip of the trunk opening and separated by 10” on center.

USRRC STRIPE STYLE

d\stripe

***Optional**: Finish and paint the rough fiberglass inside the hood so that it looks like the original aluminum.*

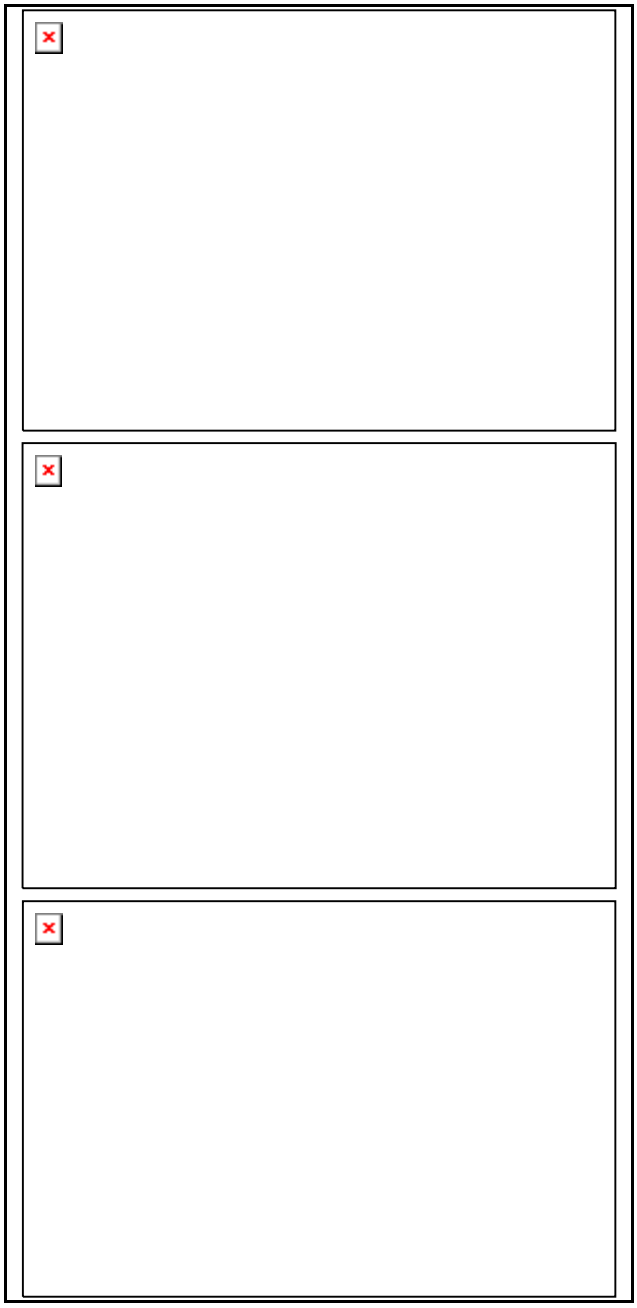
TONNEAU SNAPS

This operation can be left until last, so that the paint can be buffed one final time.

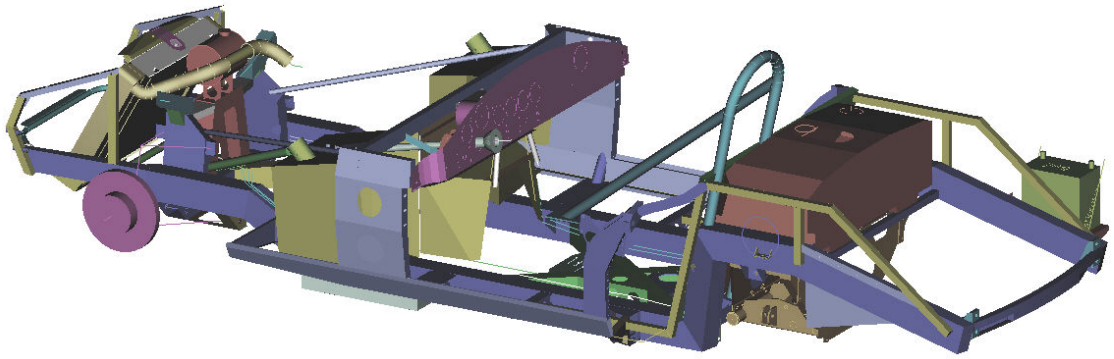
Chase the holes with a #25 drill (.150”). Install the tonneau snaps with the fiber washers. Don't force! The snap screws may twist off, leaving you with half a broken screw in the body. For extra safety and ease, use a #10 steel screw to “chase” the threads into the fiberglass before you install the snaps.

FRONT BRAKE SCOOPS

Using two #10 sheet metal screws, mount the scoops 5.4” from the centerline of the car and set back as shown. A strap attached to the inside of the chassis supports the rear edge.



SECTION E
CHASSIS ASSEMBLY



FASTENER NOTES

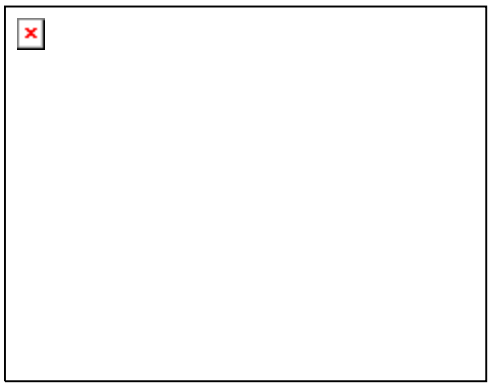
We include Grade 5 fasteners throughout our kit. They are quite strong enough for any abuse you can put your car through - and offer a bit more ductility than Grade 8 - which means they will bend before they snap.

Almost all the locking nuts in the kit are **Stover** style. Stovers are reuseable several times, unlike the nylon locking type. **However**, you must use **light oil** on the threads when assembling.

TORQUE SPECIFICATIONS

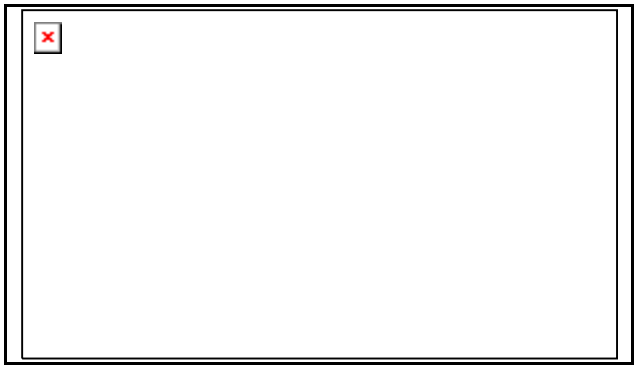
Use figures below only if unspecified in the relevant instructions. Torques listed are for **lubricated** threads or threads with liquid thread locker. All stover nut threads should be lubricated with light oil and may be reused several times.

Bolt size	**Grade 5**	**Grade 8**
1/4"	9 lb.ft.	13 lb.ft.
5/16"	18	28
3/8"	31	46
7/16"	50	75
1/2"	75	115
5/8"	150	225
Metric	**Grade 10.9**	**Grade 12.9**
M8	25 lb.ft.	29 lb.ft.
M10	47	58
M12	83	100



BRAKE AND FUEL LINES

Bolt the **brake** and **clutch master cylinders** in place.

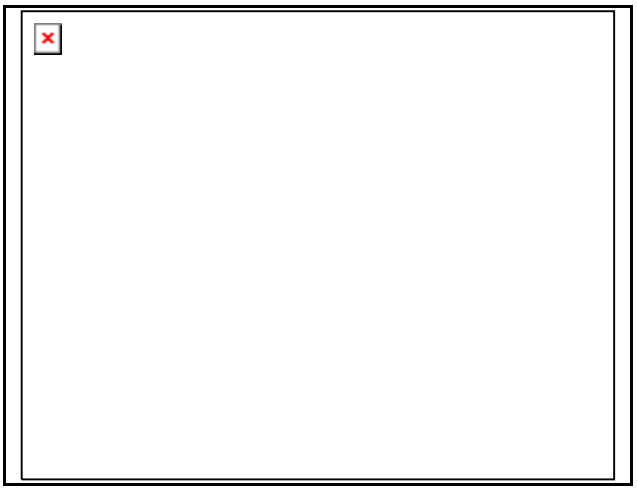


d\mastcyl

The clutch master cylinder is shown on page 124.

Replace the **brake** and **fuel lines** on the chassis. Secure the lines in place with the plastic clips and Tek© screws. Seal the thread holes with silicone to prevent rusting.

The brake and clutch filler tubes (standard BMW reservoir) are run as shown below. The optional three-can reservoir setup uses the same steel feeder lines but with appropriate rubber hose connections.



D\reslines

***Note**: The rubber hose supplied by E.R.A. is compatible with brake fluid but some others are not. Use caution if you choose to replace the hose.*

BATTERY CABLES

Parts listings are on page 21.

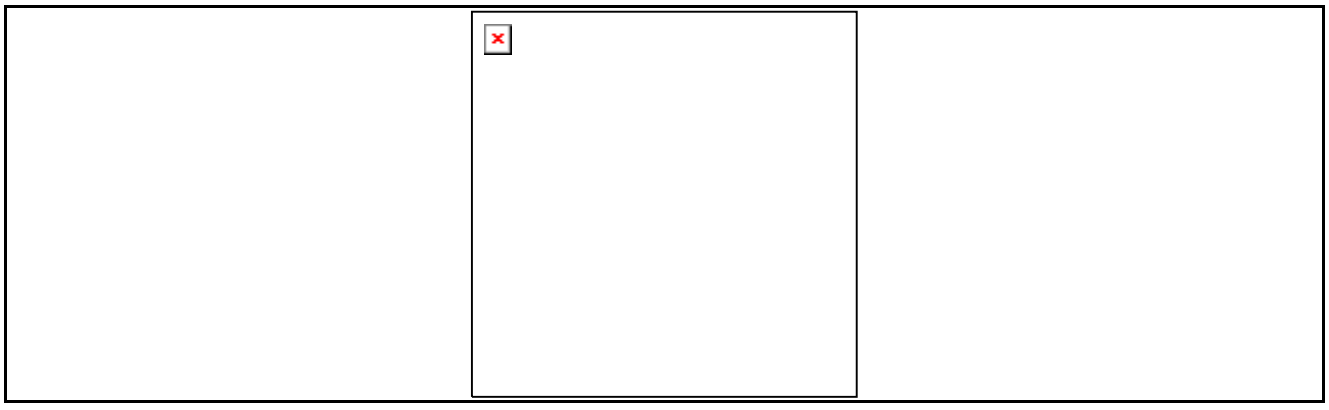
POWER CABLES

See illustration on the next page.

The cable from the battery to the starter solenoid is shown below. If you wish to install a cut -off switch, the main cable lengths are:

- Solenoid to switch: 72"
- Switch to battery: 60"

Use tape to insulate the cable where it passes through the roll bar brace mount under the floor. Fasten the cable to the footbox and the inside of the frame rails with insulating clamps. The cable from the starter solenoid to the starter is shown on page 104.



fia\man\e\battery_cable

GROUND CABLES

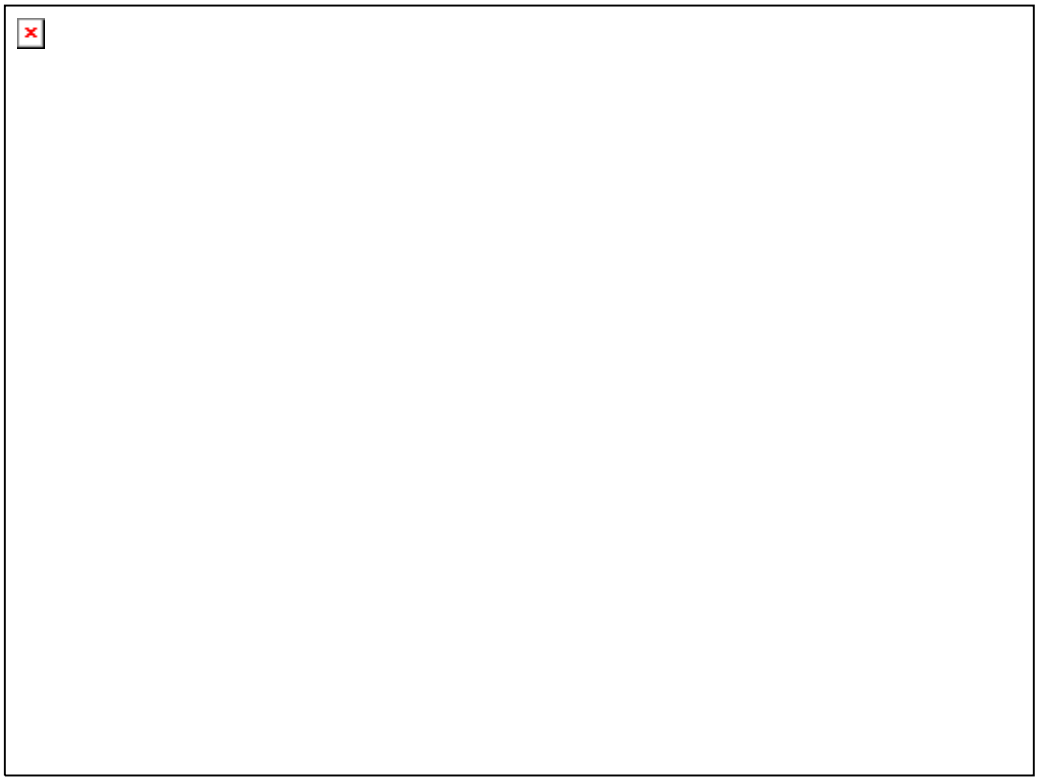
TRANSMISSION TO CHASSIS:

Fasten one end of a cable to the transmission rear cover. If you are using the transmission mount adapter, the cable can pass through the slot at the edge of the bracket. Fasten to the right side of the chassis mount. See page 104.

BATTERY TO CHASSIS (GROUND):

Pass the eye of the 32" cable around the back of the battery support. Coat the eye with grease and fasten securely to a bottom tray support bolt. See page 79 and 104 for illustrations.

SECTION F
MECHANICAL COMPONENTS



FRONT SUSPENSION

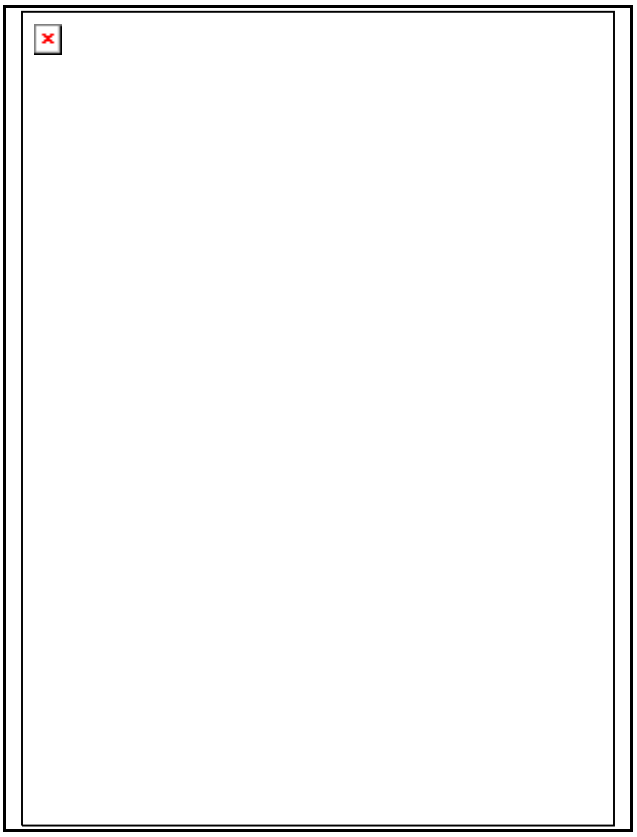
LOWER CONTROL ARM

Lubricate the chassis receptacle/brackets and the sides of the control arm bushings with silicone grease or petroleum jelly. Use a gentle oscillating motion when inserting the control arm into the mounts. Sometimes a plastic dead-blow hammer helps.

Insert the 5 1/2" x 5/8" bolt with a heavy washer through the front bushing into the chassis. Use a flat washer under the lock-nut.

Use the 3" x 5/8" bolt through the rear mount with flat washers and lock-nut.

Torque the pivot bolts to 50 ft-lb.



fia\man\d\fsusp

UPPER CONTROL ARM

The arms are installed with the ball joint hole **offset** towards the **front** of the car. The inner pivot axis is offset to the **outside** of the chassis mount. See above. Use a little silicone sealer where the ball joint passes through the hole in the control arm. This will prevent grease from leaking out of the rubber boot.

Install the arms with 3 shims front and rear between the pivot shaft and the chassis mounting brackets as a preliminary camber setting. Leave the pivot shaft end nuts slightly loose. Tighten the nuts to 60 lbft after the suspension is at normal ride height.

STEERING KNUCKLE

Install the knuckle on the lower ball joint with a washer (if needed to space nut for the cotter pin) and nut. Torque to 40 lb-ft. Tighten further to where the cotter pin can be inserted.

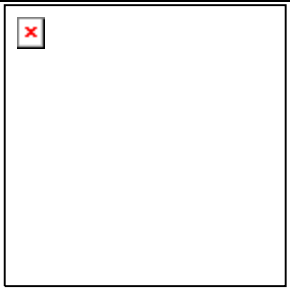
Rotate the upper control arm down, engaging the ball joint stud into the knuckle.

Install washers and nuts, torque to 30 lb-ft minimum and install cotter pin at the next line-up.

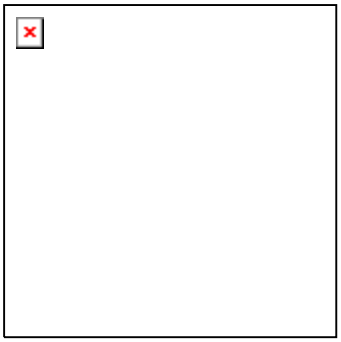
Insert the tie rod stud into the steering arm from the bottom. Fit the washer and nut, torquing to 20 lb-ft minimum. Install the cotter pin.

*If you have difficulty getting **grease** into a ball joint, back off the Zerk fitting about one turn.*

LATE FABRICATED FRONT UPRIGHT



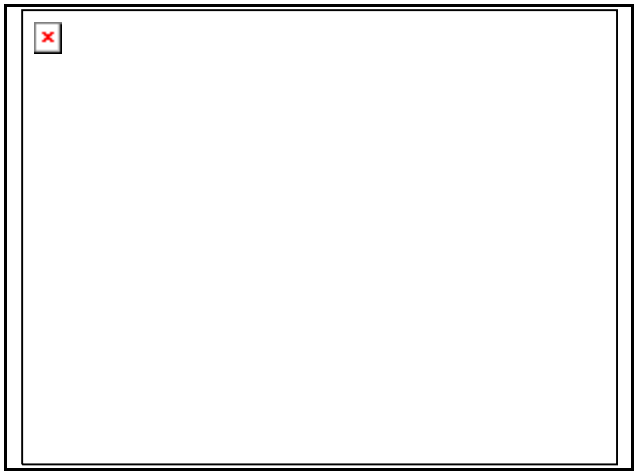
Camaro caliper on fabricated upright



4-Piston caliper on fabricated upright

ROTOR/HUB

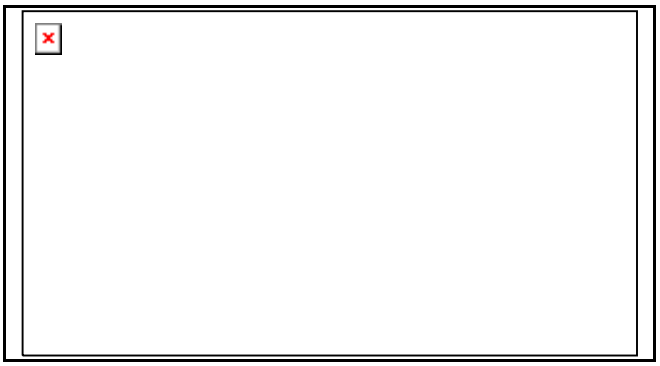
GM BRAKES

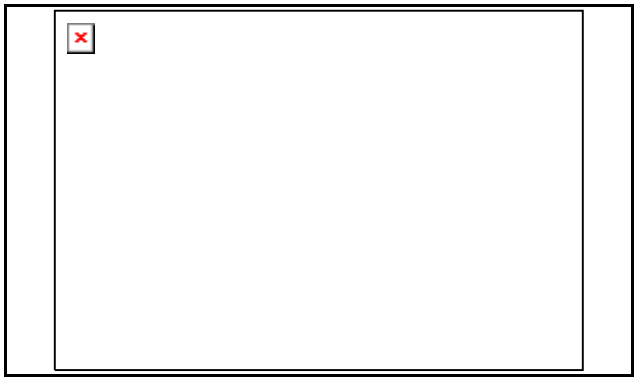


d\fhubasb

GM FRONT CALIPER ASSEMBLY

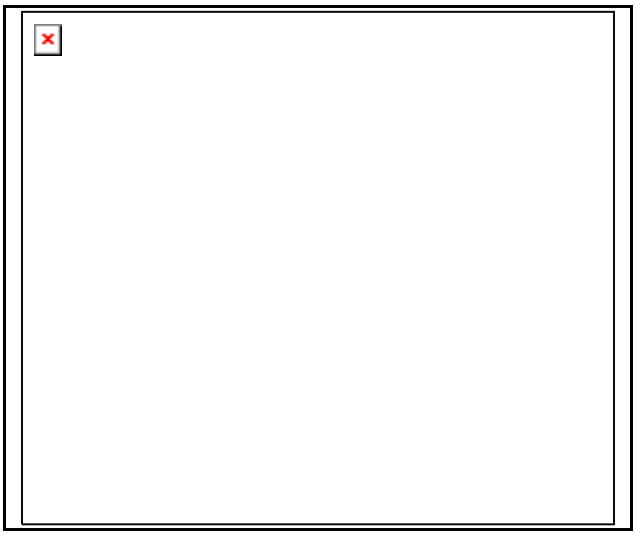
More installation details are posted at erareplicas.com/427man/ under GM pad replacement.



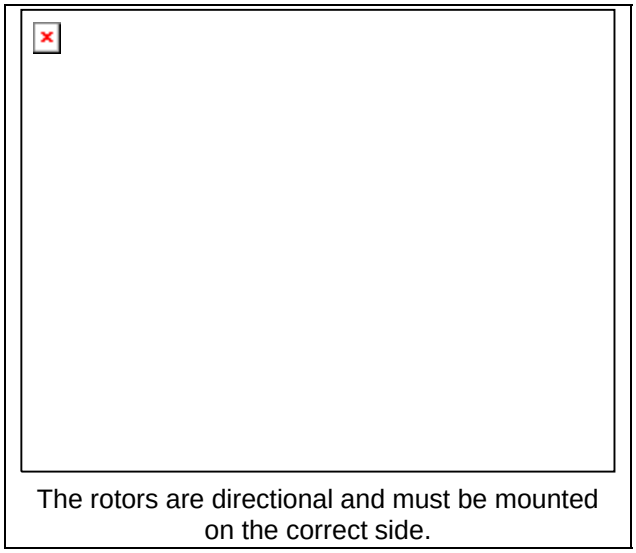


Note that the pad tabs must be bent to make the pads a tight fit on the bridge.

12" BRAKES: HUB AND ROTOR MOUNTING



f/fjfz2.gif



The rotors are directional and must be mounted on the correct side.

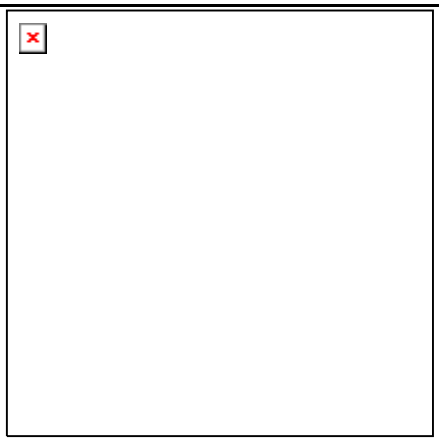
GENERAL INSTALLATION

Replacement parts are listed on page 135.

Pin drive: If the rotor is not already installed on the pin drive hub, **torque** the drive pins to 35 lb-ft (with high-strength thread locking compound, i.e. Locktite® red) and the nuts to 35 lb-ft.

If you ever need to remove the pins, they will have to be heated to 300 deg. to weaken the bond. ***Excessive heat*** *will weaken the pins.*

Always grind the rotor after installing the wheel bearing races. If you don't have a special driver for the races, let the auto machine shop install them. **Note that replacement rotors for the GM brakes/pin-drive combination require additional attention:** remove the ridge at the base of the outside face of the rotor as shown below.



GM Rotor Cleanup

Clean off the **grinding dust** thoroughly before putting grease in the hub and installing the bearings and inner seals.

Install the hub onto the stub axle with a special (tanged) washer and castle nut.

With new wheel bearings, torque the **axle nut** to 20 lb-ft. Loosen the nut and re-torque to 15 lb-inches, then tighten to the nearest cotter pin hole. Install the cotter pin through the access hole in the side of the pin-drive hub.

Note that the calipers and handed. Install them with their bleeder nipple at the top.

Install the brake calipers and pads using new hardware kits. Use **silicone grease** on all sliding surfaces.

Connect the brake line to the caliper, using the supplied banjo bolt and copper washer. If you still get seepage past the copper washer but the seat is not too bad, you may use a special sealing washer available from Earls or E.R.A.

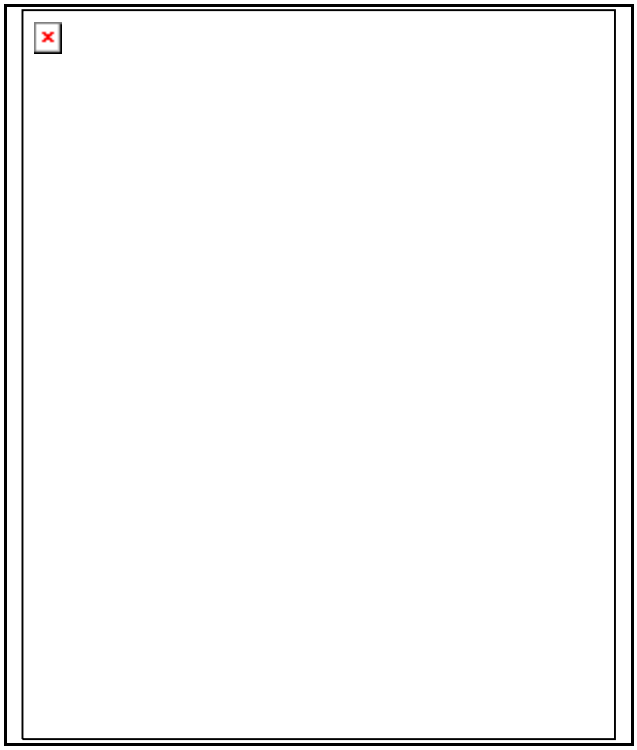
COIL-OVER DAMPER

See page 71. **Spacers** for the lower mounts are provided with the dampers. Orient the damping screw adjuster toward the centerline of the car. Use a washer on either side of the top mount. Secure the top with a 2 3/4" long bolt in from the back. A 2 1/2" bolt is supplied for the bottom attachment. Again, slide the bolt in from the back.

STEERING GEAR

The lower steering column must be installed before the steering gear. See page 83.

Prepare the rack and pinion assembly as described on page 43.



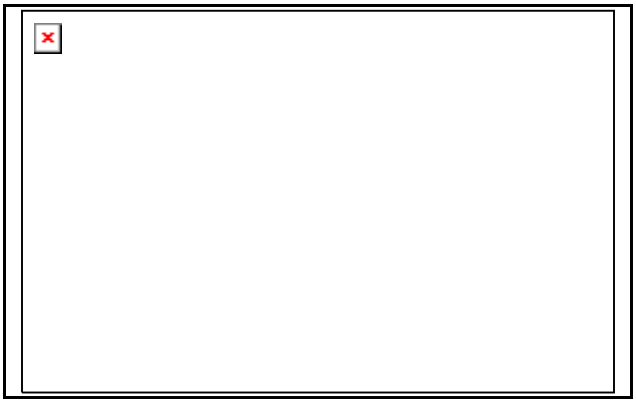
g\steeringgearmt

After putting a small amount of blue Loctite® (or similar thread locker) on the bolt threads, torque the bolts to 65 lbft.
When installing the tie-rod ends, use a jam nut on the threads so that the tie-rod can be secured after alignment.

ANTI-SWAY BAR

Threaded holes are already on the chassis. Chase any paint in the threads before installing the ($^{5}/_{16}$-18) bolts, washers and nuts. The $^{15}/_{16}$" front bar is mounted under the front frame extensions, just behind the radiator.

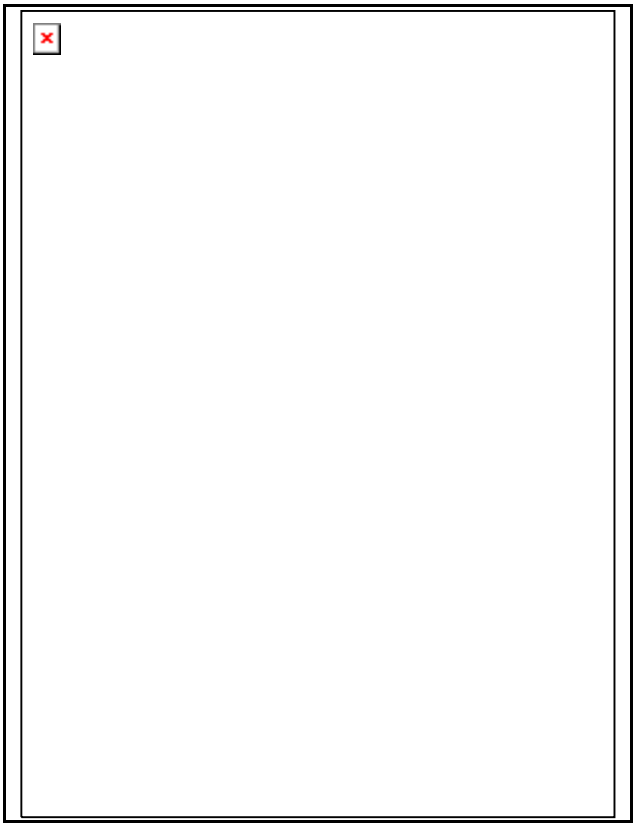
- Bolt the bar in place with the rubber/urethane bushes and clamps. The ends slant up slightly toward the outside.
- Install the connecting links between the tab on the lower control arm and the pads on the ends of the sway bar.
- Tighten the link bolts so that the rubber bush expands to the diameter of the cupped washer. Do not over-tighten.



d\fswayb

REAR SUSPENSION, JAGUAR

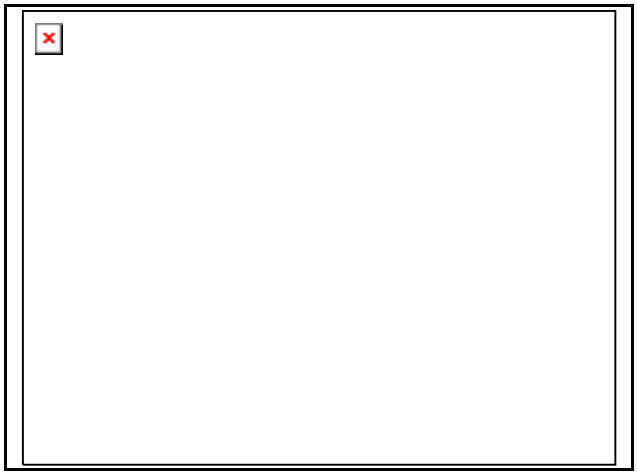
INSTALLATION



d\jagrs

Thread the trailing arms onto the rod-ends (with jam nuts) already installed on the lower control arms. See page 37. Thread on until two or three threads are left showing, but leave the jam nuts loose.

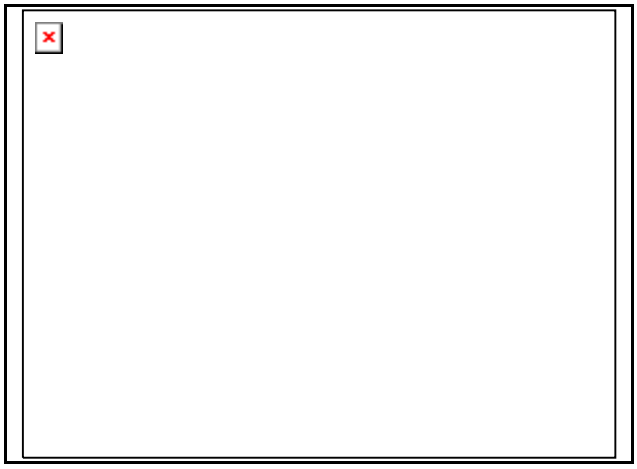
Support the chassis with jack-stands so that there is at least 19”-20” between the spare tire well bottom and the floor. This will allow you to fit the assembly on the jack and still slide it under the car from the back.



d\eracage

Raise the rear suspension assembly into position with a floor jack, guiding the forward ends of both trailing arms into the brackets on the sides of the frame.

Lubricate the insides of the upper chassis brackets with lithium grease so that the sides of the rubber bushing will slide into them. Guide the suspension assembly into the chassis brackets. Using a little light oil on the threads, install the $^{5}/_{8}$" bolts with flat washers, but don't tighten yet.



fia\man\d\trailarm

Note that the trailing arm bushing is **angled** slightly relative to the trailing arm tube.

On one side of the car: Rotate the trailing arm so that the bushing angle matches the chassis bracket. Holding the bushing against the inside of the chassis bracket, sight through from the outside hole. Use a large screwdriver to move the assembly so that the sight is straight into the threaded portion of the chassis bracket.

Slip the aluminum spacer between the outside of the trailing arm bushing and the chassis bracket. See the illustration above. Slide the 1/2" x 3" bolt through the flat washer, upper hole in the bracket, spacer and trailing arm bush, engaging the (locking) threads in the chassis. No lock-washer is necessary.

Move to the trailing arm on the other side of the car. Sight through the hole in the chassis and determine whether the length of the trailing arm will have to be adjusted. Screw the trailing arm in or out on the rod-end as necessary.

If the assembly does not line up perfectly, pry or pull on the hub carrier to shift things around while installing the spacer and bolt. If the holes do not exactly line up, grinding a taper on the bolt may make it easier to get the threads to start. Torque the bolts on both sides to 45 lb-ft.

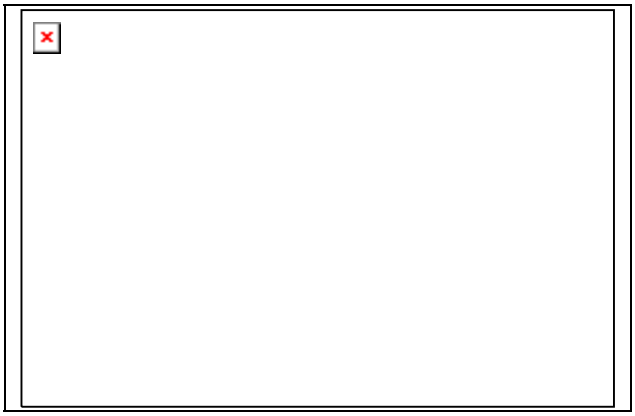
Tighten the upper pivot bolts to 90 lb-ft.

Rotate both the rod ends on the trailing arms all the way in at the top and tighten the jam nuts.

Connect the brake flex-line to the bracket on the chassis.

HANDBRAKE

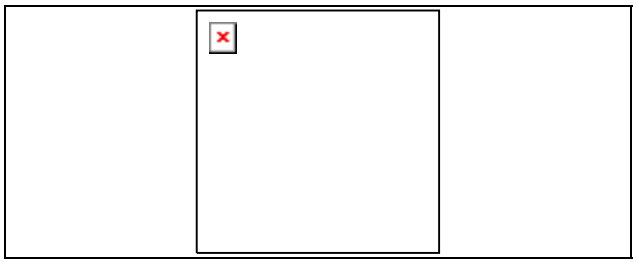
Bolt the **handbrake lever** to the bracket on the chassis with 5/16"USS bolts and lock washers.



ERA COMPENSATOR

Attach the other end of the cable to the compensator lever on the suspension cage as shown above

- Slip the cable into the slot in the block attached to the lower lever of the compensator.
- Screw the threaded end of the cable into the hole in the block.
- Attach the bracket on the cable end to the other lever of the compensator. Do not tighten the lock nut.
- Secure the cable to the outside of the driveshaft hoop with a tie-wrap.



Adjustment

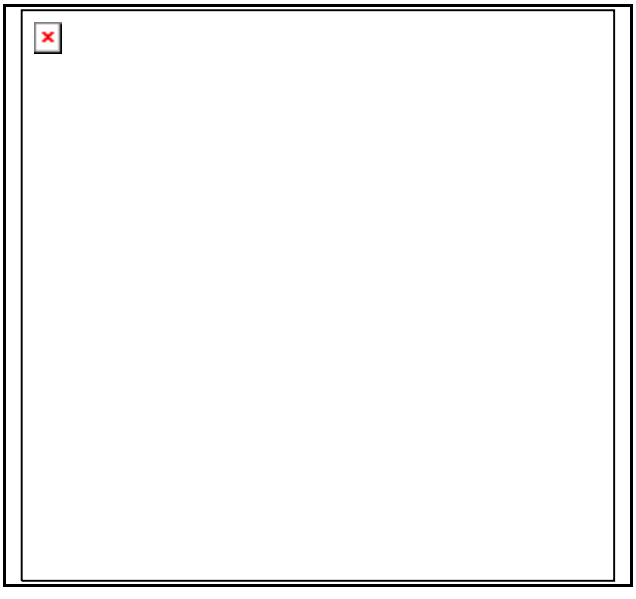
Fully release the handbrake lever. Adjust the cable length by screwing the threaded end into the block to a point just short of where the handbrake operating levers on the calipers begin to move. Check the adjustment by pressing each operating lever at the same time towards the calipers. While doing this, observe the levers of the compensator on the cage - if they move noticeably, then the cable is too tight. To prevent binding, some slack should be obvious.

Check that the cable will not come in contact with the driveshaft at any time.

ANTI-SWAY BAR

JAGUAR SUSPENSION

The 3/4" rear anti-sway bar mounts on the extensions of the rear crossmember just in front of the rear subframe



d\rswayb

The chassis is threaded for 5/16" USS bolts. If you meet resistance when installing the bolts, chase the threads in the chassis. *A broken bolt inside the frame is difficult to fix.*

Bolt the anti-sway bar to the chassis mounts using the rubber bushings and clamps.

Clamp the axle brackets around the Jaguar control arms. Position them behind or just to the inside of the trailing arm rod ends as shown.

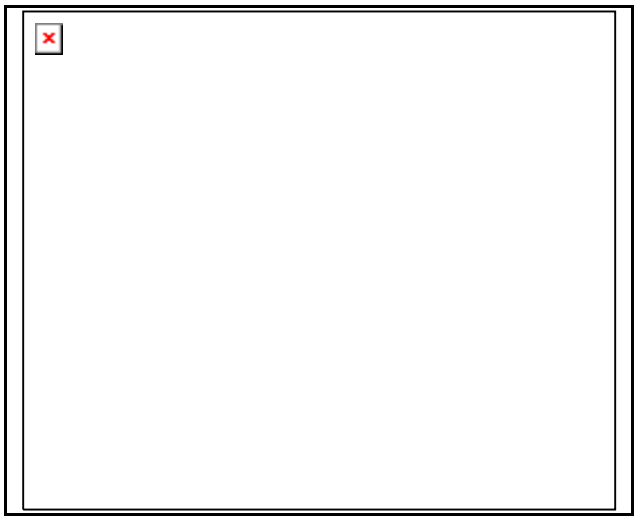
Install the links between the axle brackets and the ends of the anti-sway bar. Tighten the link bolts so that the rubber bush expands to the diameter of the cupped washer.

REAR SUSPENSION, E.R.A. (FIA ONLY)

See the other assembly information starting on page 40 for more diagrams!

INSTALLATION

Adjust the upper trailing arm length to 10.3" between rod end centers, leaving on of the jam nuts loose. Insert a ½" x 4 ½" HCS from the **inside** of each vertical chassis rail. Insert the left hand threaded rod end of the trailing arm, add a flat washer and stover nut. Tighten to approximately 75 lb-ft.



fiat\rs\d\erarsins

Adjust both lower trailing arms to 16.5" between the centerline of the front bushing and the center of the rod end, leaving the jam nut loose.

Attach the upper trailing arms to the upright extensions.

Support the chassis with jack-stands so that there is at least 19”-20” between the spare tire well bottom and the floor. This will allow you to fit the assembly on the jack and still slide it under the car from the back.

Carefully jack the assembly so that the upper mounts engage into the chassis brackets similarly to the Jag installation shown on page 75. Slide the ⅝” x 4.5” HCS with a flat washer through the chassis and rear subframe bushing. Start the threads with an air wrench or a ratchet. There is a welded-in stover nut on the inside of the chassis bracket so no lock washer is necessary.

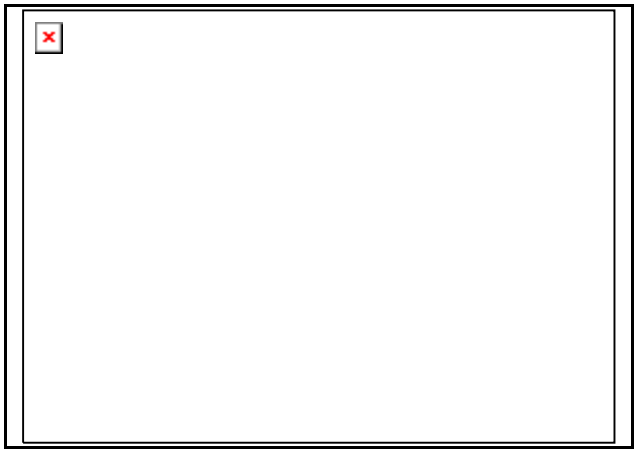
Rotate the subframe forward until the front mounts (see page 40) line up horizontally with the holes in the chassis crossmember. Start a couple of the allen-head cap screws ($^1/_2$"-13 x 1 $^1/_4$") to confirm the alignment. If there is a gap, use shims fill it. Tighten the cross-shaft nuts to 20 lbft and then to the nearest cotter pin alignment. Tighten the front mounting bolts and upper mounts.

Attach the lower trailing arm (bushing end) to the **lower holes** on the chassis. Note the slight angle of the bushing on the forward end of the trailing arm. See page 75 for hints.

Alignment is described on page 128.

EMERGENCY BRAKE

Attach the emergency brake cables and balance bracket as shown. The front cable is attached to the handle similar to the Jaguar cable.



d\eraeblay

DRIVE SHAFT

The driveshaft is a special fabrication that may be purchased from E.R.A. or built by a local driveshaft shop. Driveshaft specifications for all "approved" transmissions are on page 42.

INSTALLATION

Use Grade 8 bolts and washers, and stover nuts if possible. Aircraft style shoulder-bolts are available from E.R.A..

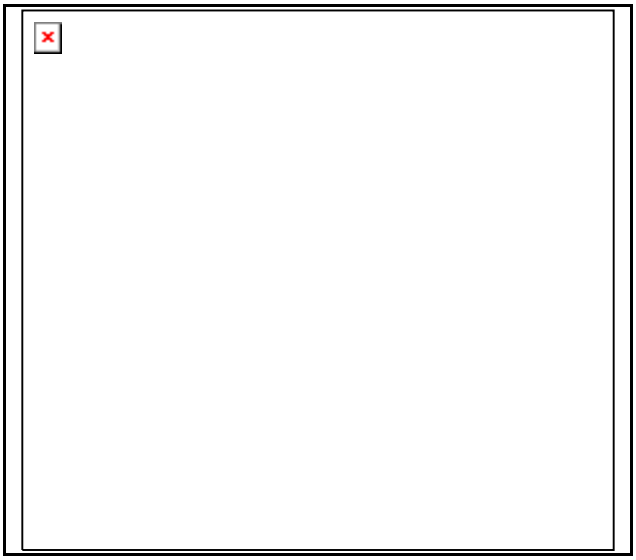
Lubricate the inside and outside of the slip yoke with light oil. If your transmission tail-shaft uses a leather seal, lubricate the seal with light oil also.. Use EP grease to lubricate each universal joint.

SAFETY STRAP

Install the strap into the holes on the chassis support below the driveshaft and bolt into place. Note that the bracket for the emergency brake ballance assembly (E.R.A. suspension only) mounts between the strap and the chassis. See the "Emergency Brake" section above.

ID PLATES

Install the car ID plate with $^1/_8$"diam. x $^3/_8$"L aluminum blind rivets as shown. There are usually "shadows" of the rivet holes in the surface of the fiberglass.



d\idplate

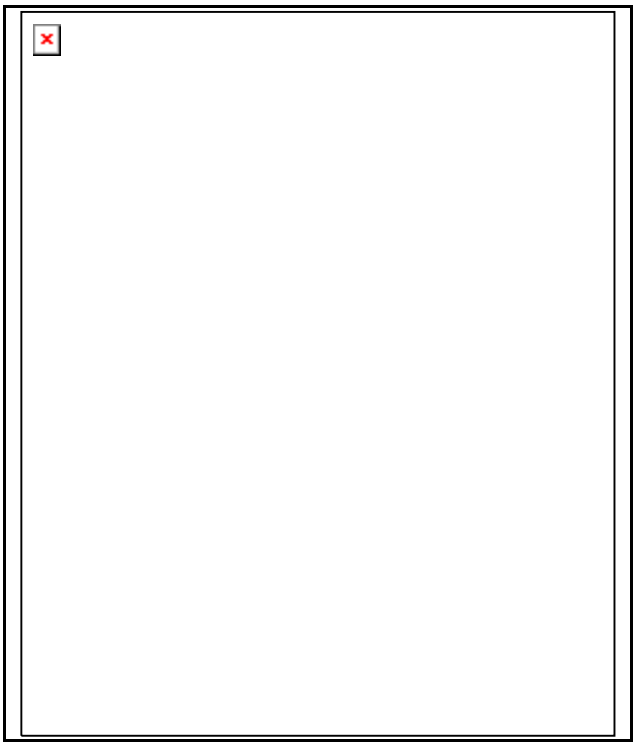
MORE CHASSIS AND BODY ID NUMBERS

*The **chassis** is stamped with the ID number in two places:*

- *The top of the left front shock mount (under the brass ID plate).*
- *On the outside of the horizontal section of the frame just inside the right rear tire just above the subframe bracket.*

BATTERY/MOUNT

Bolt the tray in place onto the right rear frame rail as shown. The chassis is pre threaded with $^{5}/_{16}$"-18 inserts.



d\batbox

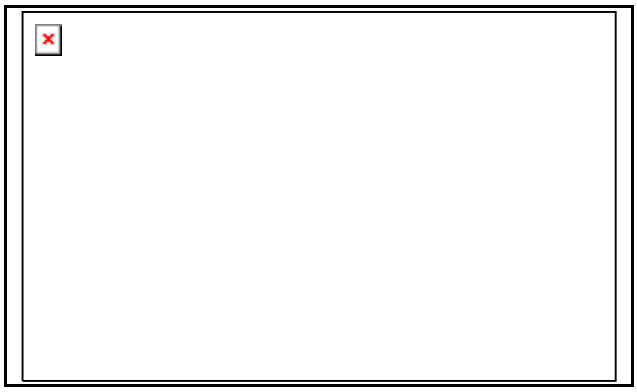
Install the inner panel at the rail side.

Install the splash panel to seal the battery area at the frame rail and over the two studs on the battery box.

Battery **cable** installation is described on page 104.

***Note**: Don't drive vigorously without the splash panel installed. It helps support the battery.*

VOLTAGE REGULATOR



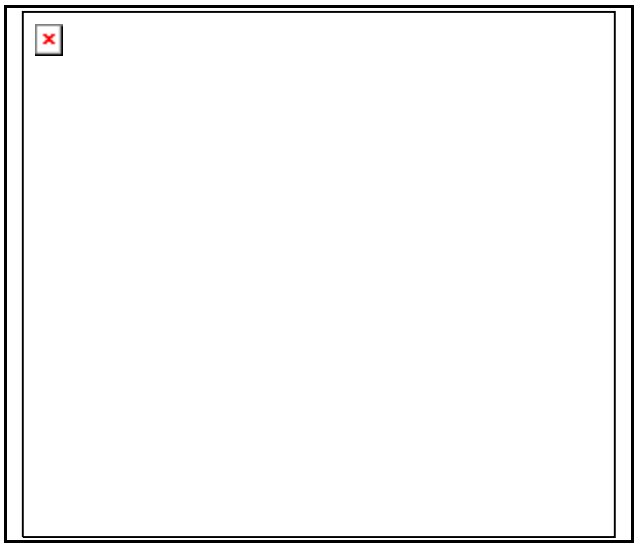
d\voltreg

The regulator (part number on page 24) installs with #10 screws on the left inner fender panel into plastic inserts.

Note that the regulator case **must** be grounded with the black wire from the harness.

ACCELERATOR PEDAL AND LINKAGE

All components come preassembled in the standard kit.



d\throtlnk

When assembling the longitudinal links onto the sides of the bellcranks, pick the straightest front-to-rear paths. The diagram above is typical but may not be ideal for your setup.

To remove the pedal from the pivot box, remove the setscrew through the access hole in the casting. Remove the bellcrank and slide the shaft out.

Important! *Do **NOT** trim the engine-end of the cross-shaft excessively. When the engine torques over under load, the support can move quite a bit. Leave at least 2" of shaft past the supporting rod end.*

ADJUSTING THE LINKAGE

Wire the carburetor linkage fully open.

Install the cross-shaft support onto the engine, orienting it so that the shaft is as parallel to the firewall as possible and fairly horizontal.

Install the link from the carb to the cross-shaft, adjusting the length so that the cross-shaft bellcrank is angled back, about 30 degrees toward the firewall.

Adjust the bellcrank on the pedal shaft so that it is angled back toward the firewall about 20 degrees when the pedal is bottomed out on the floor.

Install the link from the pedal to the cross-shaft so that the pedal is about $^{1}/_{2}$" from hitting the floor.

Remove the wire holding the carburetor linkage and check whether the pedal is at a convenient height. If it is too high, change the link footbox link to a lower hole on the cross-shaft. If it is too low, change the engine link to a lower hole on the cross-shaft.

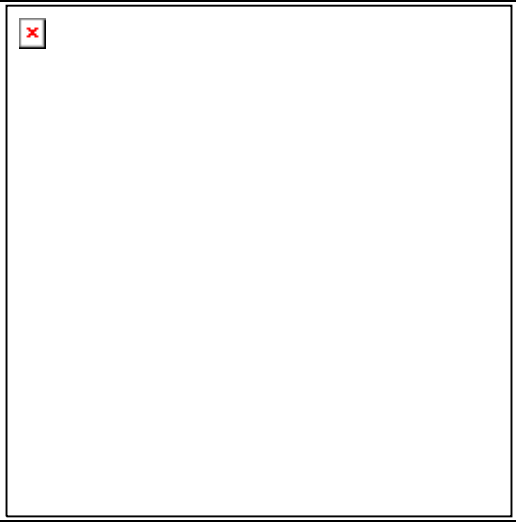
Install the return springs and check whether you're still getting full throttle.

Tighten all bolts and jam nuts, check for interference, and grease all the pivot points.

If you want the "smooth look" shown below, cut some $^{5}/_{16}$" brake line to length to cover the middle section of the threaded rods.

Note: This linkage can be adapted to most engines. If yours requires something different, call us.

For **Weber carburetors**, a duplicate of the original bellcrank pivot stand is available from E.R.A. If you are using a blow shield with a wide flange on a 289/302, the flange must be trimmed around the bracket.



ENGINE AND TRANSMISSION INSTALLATION

Refer to page 29 for engine and transmission preparation. **To check compatibility**, trial fit the transmission to the engine **before** any attempt to install either into the chassis. Note that **the engine and transmission are offset toward the passenger side of the car** by one inch to balance the driver's weight and to give more legroom for the driver.

If you are using a blow shield, check the **concentricity** of the hole that locates the transmission. Put a dial indicator on the flywheel and indicate the hole ID. If the eccentricity exceeds the recommendations (generally about 0.010"), you must use **offset dowels** to locate the bell housing on the engine block.

Install the engine mounts as shown on page 29.

Here at E.R.A. we first assemble the engine, clutch, bellhousing and transmission on the floor, just as it would function in the car. The primary pipes will be installed once the engine and transmission are insalled.

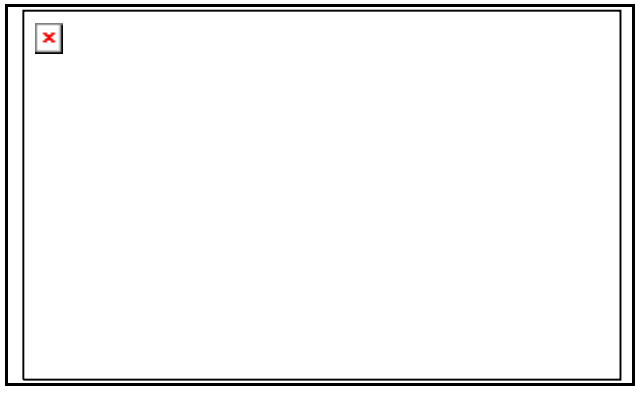
Once everything is checked, we remove the transmission from the engine/bellhousing assembly.

It's easiest to install the engine and transmission separately. If you have a stationary engine lift, have the dolly wheels or the suspension installed so that the chassis can move under the engine.

The engine/bellhousing is then installed in the chassis.

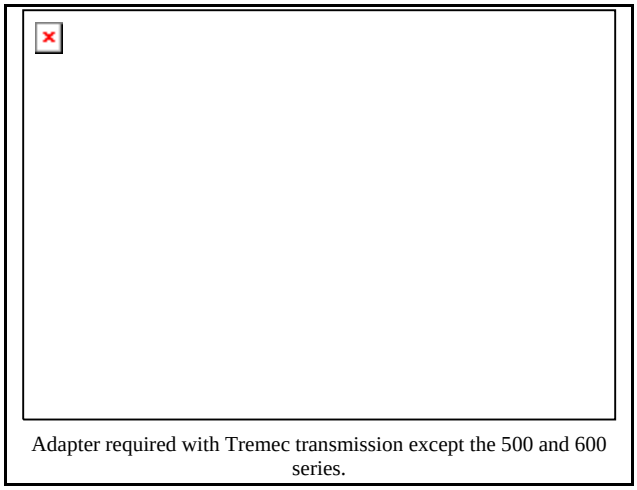
If you are using a Ford Top Loader, T-5 or Borg-Warner 4 speed, install the transmission adapter on the front of the "X" member. The Richmond Gear and Tremec 5 speed transmission don't use the adapter.

***Note** that some bell housings for Tremec units also require a spacer between the bell housing and transmission so that the input shaft doesn't bottom out in the crankshaft.*



transmt.jpg

Tremec transmissions with short input shafts (that don't use the front spacer) are mounted on the rear holes of the adapter. Tremecs that use the spacer are mounted without the adapter with the same mount as the Richmond Gear. See page 81.



Adapter required with Tremec transmission except the 500 and 600 series.

\d\tremecmt

Wrap rags or towels over the front tower and over the top of the transmission tunnel to prevent paint scratches.

With the engine on a hoist and tilted down at the clutch end, carefully lower it onto the engine mounts.

Lower the engine, engaging the studs on the engine mounts into the slots in the mounting perches,

Loosely install the washers and nuts onto the engine mount studs.

Raise the back of the engine, either by changing the tilt of the adjustable engine lift or with a jack underneath the rear of the engine.

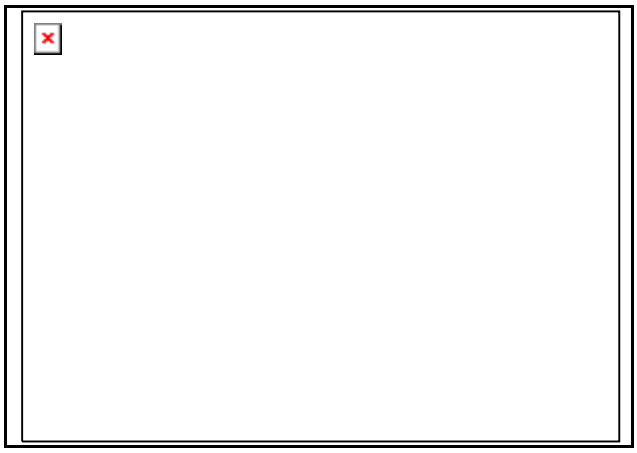
Install the clutch and bell-housing on the engine. See notes on page 32.

Carefully install the transmission onto the back of the engine. You may have to rotate the transmission input shaft to engage the clutch disk. Immediately install the top bolts to prevent clutch disk damage from the transmission hanging free.

Install the starter and the balance of the bell-housing bolts.

Lower the back of the engine, engaging the transmission mount studs into the chassis:

- **Top Loader** - Front holes of trans adapter.
- **Borg Warner** - Front holes of adapter.
- **T-5/Tremec 3550** - Rear holes of adapter. Depending on the transmission casting, you may have to relieve the front of the transmission mount. Use spacers between the adapter and the mount to raise the output centerline to 3 ½" above the X.
- **Richmond gear** - No adapter necessary



d\transmt.gif

Check that the engine is level side-to-side in the chassis. Adjust if necessary.

Tighten all mounting bolts.

Removal is accomplished in the reverse order.

Special Note for Automatic Transmissions

There is no transmission oil cooler built into the radiator. To avoid transmission overheating you must mount an auxiliary cooler in the system. It can be mounted in place of the engine oil cooler or in front of the radiator.

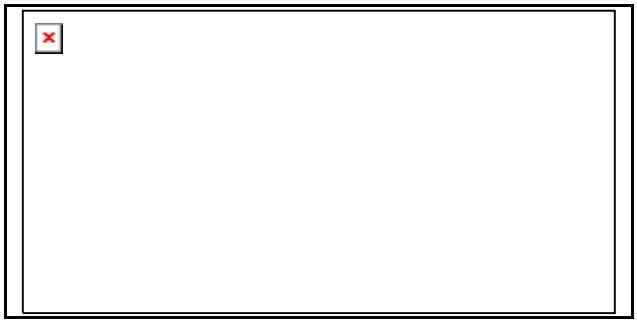
Clutch height adjustment is covered on page 82.

BRAKE PEDAL HEIGHT

Master cylinder installation is described on page 68.

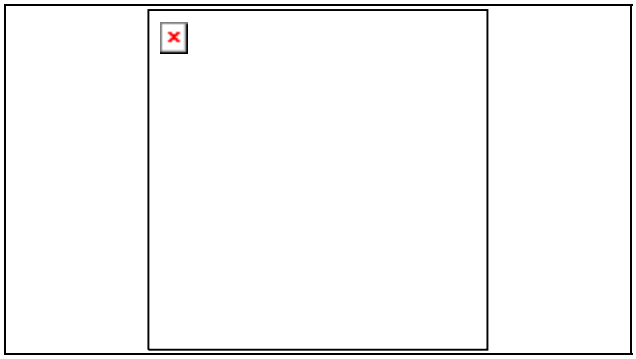
For people of average height, set the distance from the rear of the pedal face to the forward part of the foot-box to about 7". If you are much taller or shorter, you may move the pedal up to 3/4" forward or backward as needed.

ADJUSTMENT



f\braklink

Because the front brake wheel cylinders require more fluid than the rears, the balance bar is always set up with the outside push-rod 1/4" **longer** than the inside one.



BALANCE ADJUSTMENT

*The rod **length** has no effect on the front/rear brake bias (which end locks first). If necessary, the bias can be adjusted as described on page 130.*

For a preliminary setting, adjust the outer rod so that there are 3/4" of threads showing on the outer master cylinder rod, 1/2" on the inner rod (with the jam nuts against the rod end.)

To change the **brake pedal height**, turn both threaded rods **equally** in or out.

Check the tightness of the brake line junctions and switch fittings.

Install the brake cover box.

The brake or clutch pedal face angle can be changed with the top stop screw. See page 60.

CLUTCH PEDAL HEIGHT

See page 60 for parts assembly.

The clutch pedal face should be approximately even with the brake. If your clutch requires more throw than normal, you may need to keep the pedal face higher, or, in desperation, use a larger clutch master cylinder. A modified 7/8" or 1" Tilton master cylinder can be installed on the stock bracket, *but is rarely necessary*. Almost all **clutch release problems** are the result of incorrect installation or incompatible parts. Stock linkage and hydraulics give approximately 3/4" throw at the outer end of the fork. See page 125.

ADJUSTMENT

The throw-out arm angle can be changed to raise or lower the pedal:

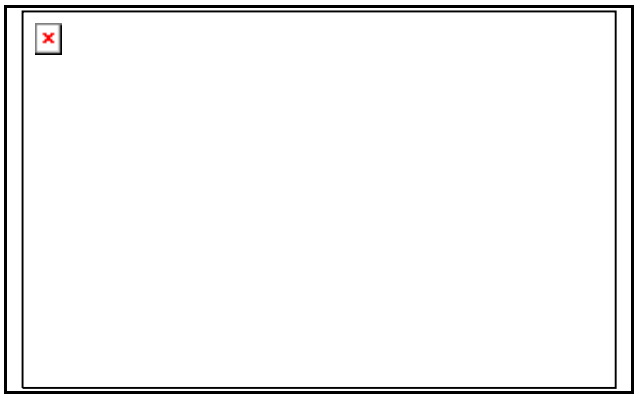
- Loosen the retaining bolt and slide the arm off the spline. It may be necessary to disconnect the clevis from the arm.
- Have someone hold the clutch pedal at the desired height and re-install the arm. Tighten the retaining bolt.

You can make small height changes by changing the length of the connecting rod.

Clutch bleeding and adjustment are described on page 124.

DEAD PEDAL INSTALLATION

Drill the footbox as indicated (through fiberglass and steel sheet-metal) for the included sheet-metal screws to secure the dead pedal.



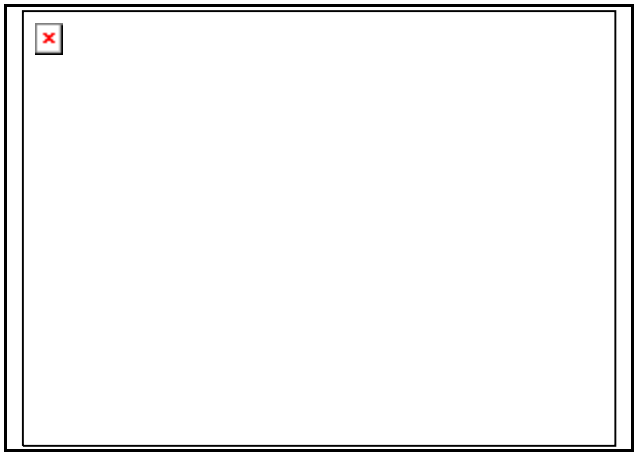
D\deadped

LOWER STEERING COLUMN

INSTALLATION

ERA (MODIFIED MUSTANG II)

Because the connection is splined, the intermediate column will fit no matter what the orientation of the shaft. Final steering wheel alignment is done with the splines at the steering wheel hub.



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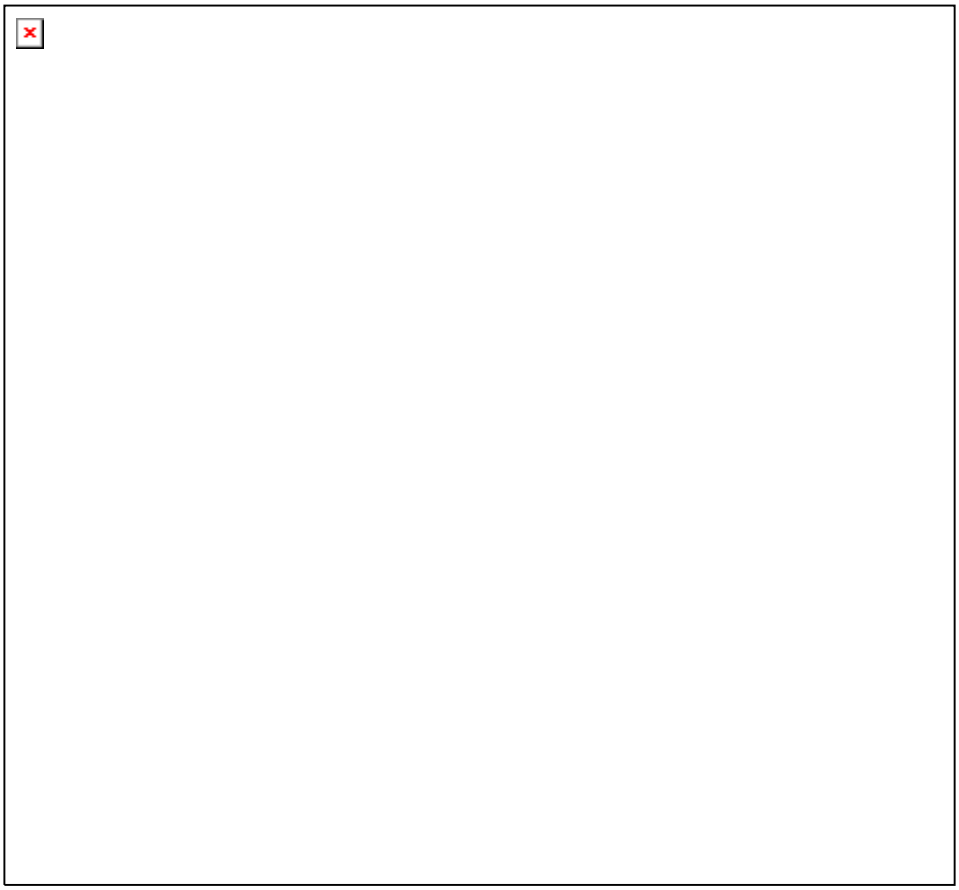
SECTION G
BODY II



WIRING HARNESS LAYOUT

*All individual connections are detailed in a **separate list** that comes with the harness. A **wiring diagram** and **trouble-shooting guide** are also included.*

The wiring system is divided into **three modules,** held in place with the clamps provided:

- The **front harness** makes connections from the front lights to the firewall.
- The **dash harness** makes all dashboard and column connections.
- The third harness runs from the left side of the dashboard area to the **rear components**.

Install the electrical components on the **firewall** and **foot-boxes** into the pre-drilled holes as shown in the wiring instructions. The general layout is described on the next sections.

Install the **ballast resistor** (if you are using one) after laying out the front harness in the car. See the diagram on page 79.

Use the layout diagrams below and the wiring instructions to find reference points in the harnesses.

FRONT WIRING HARNESS

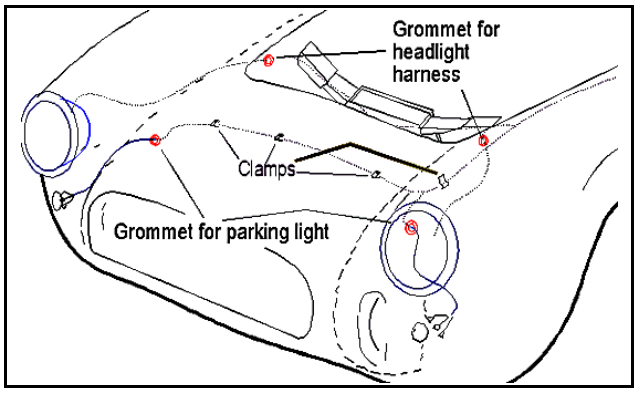
***Also** see the detailed diagrams in the wiring instructions.*

From the engine compartment, pass the multi-connector blocks (one at a time) through the large hole in the center of the firewall. Once all the connectors are through, insert the grommet into the hole, using a dull screwdriver to push the back edge of the grommet through the hole, bit by bit.

FIREWALL

g\fwwire

PARKING LIGHTS



g\fparkwir

X-MEMBER

g\hornwire

DASHBOARD HARNESS

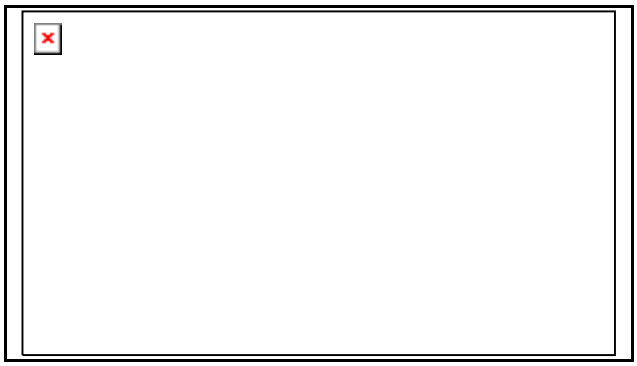
Wire the dashboard off the car. See the separate wiring instructions for individual connections. Make the final connections to the dash and steering column after everything is installed in the car,.

REAR HARNESS

***Don't install** the multi-connector block on the front end until the harness has been passed through the hole in the side of the footbox.*

Install the harness from inside the trunk as shown. Tape a stiff wire to the harness, then pass the stiff wire through the passage, dragging the electrical harness behind. See the diagram in the wiring instructions.

Pass the harness under the door sill and through the hole in the driver's footbox as shown.



e\doorwire

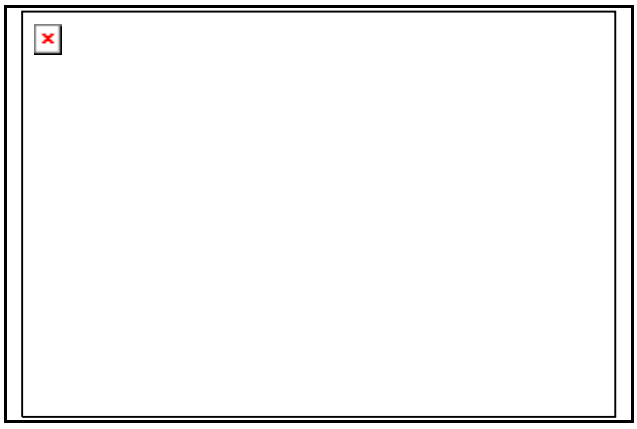
INTERIOR PANELS

The inner door sills and the rear bulkhead panels behind the seats are attached with rivets and sealant. If you had E.R.A. bond the body, these panels are already attached permanently. If not, leave the temporary fasteners in place while you drill through the holes in the panels with a $^{9}/_{64}$" bit.

REAR BULKHEAD PANEL

Blind rivet the panel as shown, using the factory locating holes and drilling new holes in the chassis where needed. Some urethane or silicone sealer will prevent any possible buzzing between the bulkhead and main frame.

If you wish to mount a battery cut-off switch see page 68 for the recommended position.



fiat\man\d\rbulk

SILL PANELS

The rear wiring harness must be in place before installing the sill panels.

Secure in place with the screws used for shipping. Drill holes for $^{1}/_{8}$" pop rivets every 2" or 3" on the bottom flange, door opening, rear steel support rail and through the front flange that rests against the vertical support rail. Align the edges of the front flange with the side of the vertical rail.

Note: Seal between the front horizontal flange and the body with caulking or foam rubber.

DOORS

DRILL HOLES FOR SNAP FASTENERS

Use the (Street interior only) aluminum banana strips (note that the left and right are different) as a template to drill ¼" holes into the fiberglass door inner panel.

INSTALLING POCKETS

Lay the doors on a soft surface, outside surface down. Snap the foam-covered metal door pocket attachment plates into the holes along the lower edge of the door. The plates are marked left (L) and right (R).

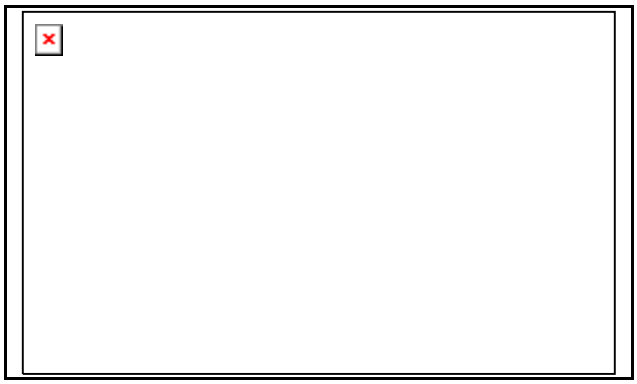
Position each door pocket on the door with the rear corner completely under the door latch with $^{1}/_{8}$" to $^{1}/_{4}$" of the pocket showing at the top and rear sides of the latch. Locate the screw holes with an awl and screw down the latch.

g\doorpnl2

Stretch the door pocket into place with its forward edge even or slightly past the front edge of the door frame and $^{2}/_{3}$ of the way up from the hinge bottom mounting holes. Hold the top of the pocket in place with masking tape.

Attach the hinge loosely with the two upper bolts. Mark and punch holes for the two lower bolts through the door pocket. Attach the bottom of the hinge and snug the bolts.

Gently and evenly pull the bottom edge of the door pocket down over the bottom edge of the door. Stretch only enough to eliminate any wrinkles. Hold in place with several pieces of tape. With a temporary marker, trace the profile of the lower edge of the attaching plate onto the pocket. Also mark where both ends of the plate fall.



d\doorpnl3

Remove the door pocket from the door and trim the edge of the door pocket approximately 1" outside the marked line. Cut wedges out of the edge of the material almost up to the marked line.

g\doorpnl1

Re-install the pocket onto the door. Apply contact cement to the edge and backside only of the attachment plate and the back-side of the pocket material. Let dry to a tack-free condition.

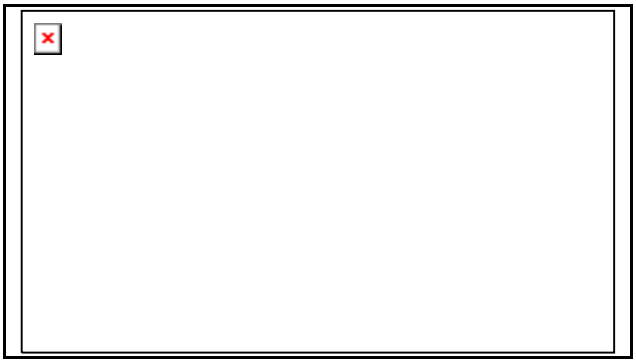
Carefully stretch the material over and partially around the attachment plate.

Remove the attaching plate from the door. Tape or clamp the upper edge to a flat surface and finish gluing the edge.

Before attaching the pocket to the door, glue the rug (items 7 and 15 in the rug installation diagram on page 108) to the inside of the door with contact cement. Install the door pocket and the latch onto each door.

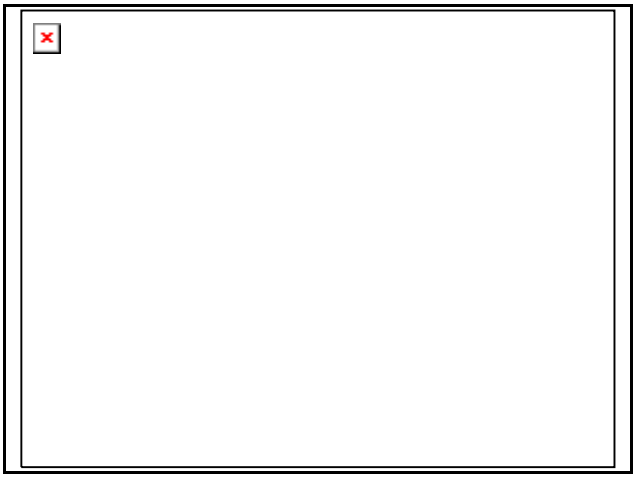
DOOR WEATHERSEALS

Lay the doors, outer surfaces down, on a soft surface. Glue the door weatherseal provided onto door lip about $^{1}/_{8}$" from the door edge. Use contact cement or weather-strip adhesive. Don't stretch the weather-stripping: It will eventually shrink to its original shape, pulling away from the corners. It's better to compress it slightly around corners. Trim the ends of the weather-stripping as shown.



DOORGASK

SIDE CURTAIN FERRULES



FERRULE

Slip the ferrules into the holes on the top of the doors and note the length that each extends past the inner panel.

Mark each ferrule so there are no more than 2 or 3 threads showing between the mark and the door surface on its shortest side,

Cut off the excess at the mark, and slightly round off the edges with a file or sander.

Hold the ferrules in place with the retaining rings provided. Seat the retaining rings against the door surface tightly.

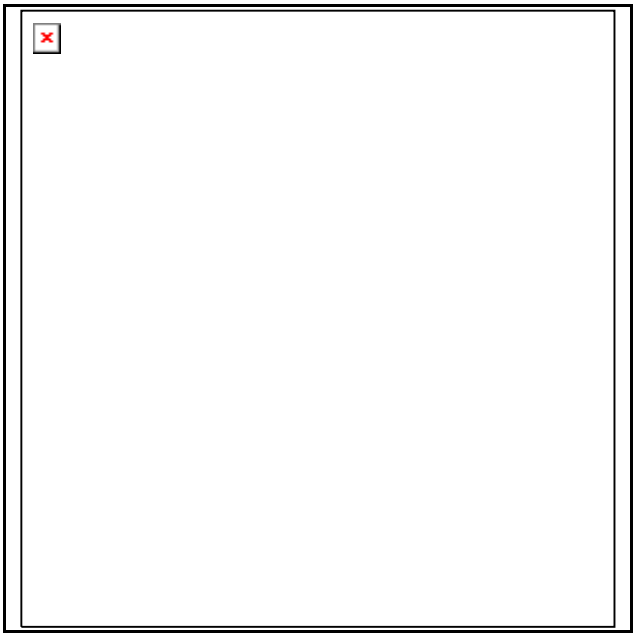
DOOR INSTALLATION

Bolt the **door hinges** onto the chassis with the **side closing plates** and original **shims** that go behind them. The plates seal off the cowl area from the engine compartment and have weather-stripping glued to their outer edges to seal against the body. See page 86. Don't tighten the hinge bolts.

Bolt the door to the hinge, lightly snugging the bolts. If the car is already painted, consider using masking tape along the door and body edges to prevent damage when assembling.

The door edge may be aligned with the body opening by loosening the bolts where the hinge attaches to the door.

To adjust the surface of the door relative to the body, loosen the hinge where it attaches to the chassis. Once the door is properly located, tighten the hinge bolts.



fiat\man\g\drlatch

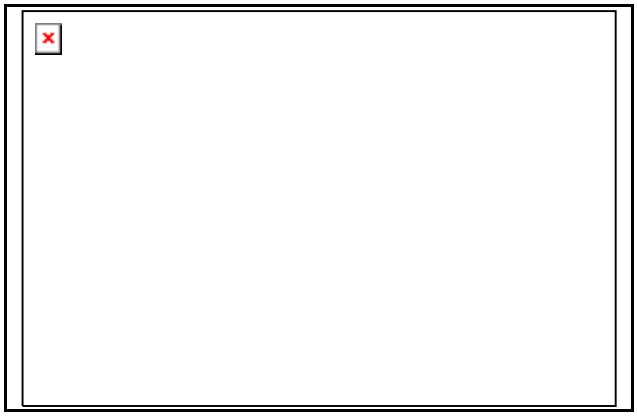
Bolt the **latch striker** to its mounting plate and install the assembly loosely to the chassis. Remember to replace any shims found earlier. Close and latch the door while allowing the striker to self-align with the latch on the door.

Tighten the striker bolts. Don't worry about the door fitting flush at the rear. The latch striker must be refit when the rugs are installed.

With the door shut, the rear edge must be adjusted **parallel** to the body opening `from top to bottom. Hold the door so that the top edge matches the body. If the bottom edge of the door does not match, adjust the rocker panel by shifting and/or shimming the rocker on the chassis mounts at the front of the door opening and at the end of the rocker.

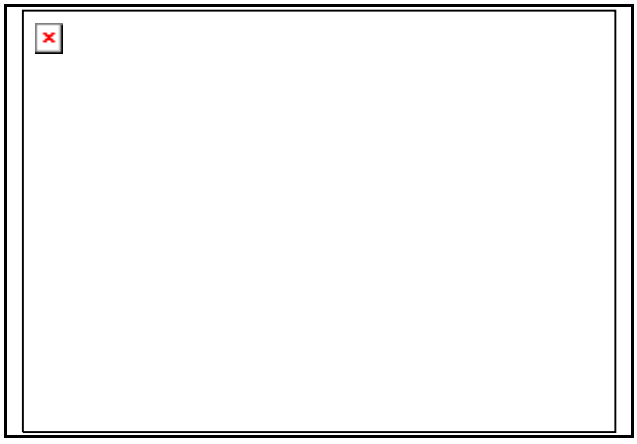
DOOR PULL STRAP

Drill a hole (#30 bit) just to the rear of the side curtain ferrule. Loop the strap over the latch ball and use the screw and countersunk washer at the front.



HINGE COVERS

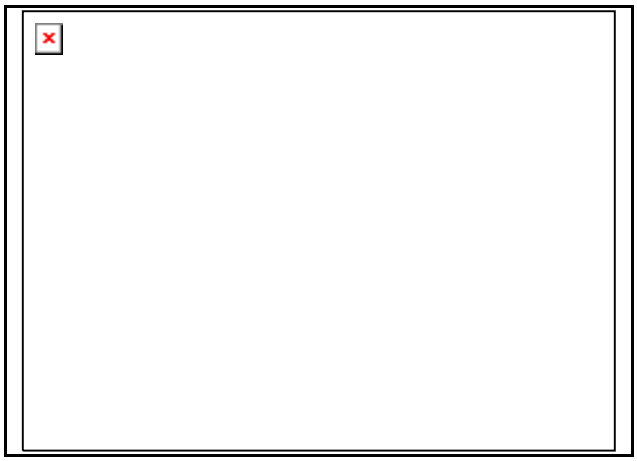
The fiberglass covers are different from left to right. Don't over-tighten the screws when installing.



eint\HINGCVR

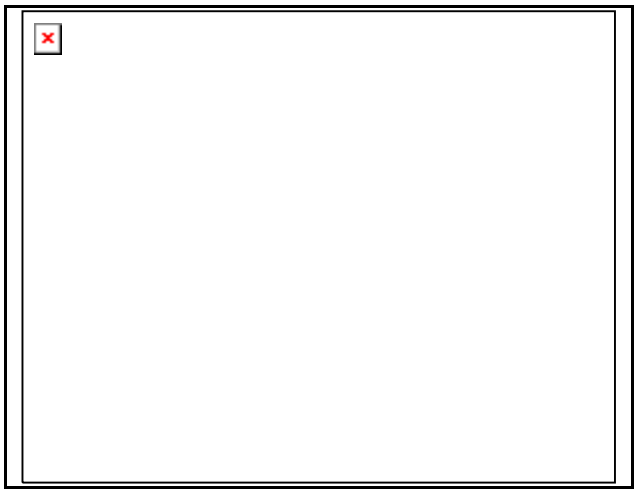
HOOD

Bolt the hinges loosely into the body from inside the grille opening. The hood hinges are marked **L** and **R**. The trunk hinges are similar but cannot be exchanged for the hood hinges and are marked with a **T**. Fit any shims found earlier.



ebod\HOODHNDL

The hood is held off the body flange with 7 rubber bumpers held with sheet-metal screws. (Extra engine compartment ventilation is gained by leaving gaps). If you lose the holes during the body preparation process, position the bumpers as shown in the diagram on page 90.



Hoodgask

Lay the hood carefully onto the body, centering with cardboard or wooden shims inserted between the sides of the hood and hood opening. Leave a gap at the front edge so that the hood doesn't chip the paint when opened.

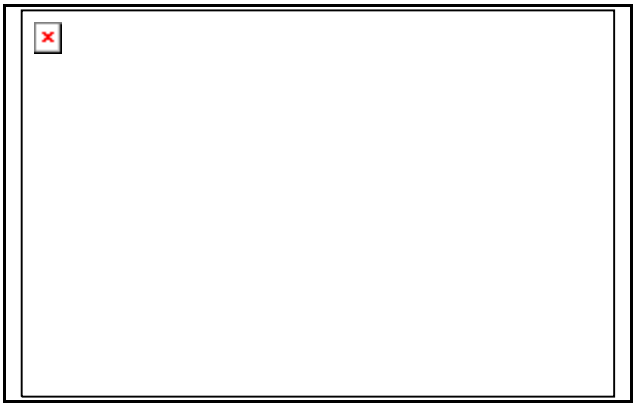
From inside the grill opening or engine compartment, lift the hinges assemblies into place. Align and bolt to the body and hood with the shims used earlier. Tighten all bolts.

Carefully lift the hood, checking the front edge clearance. Adjust and/or change shims if needed.

Adjust the **hood strikers** on the firewall so that the hood is flush with the body. The hood seal will be compressed slightly, eliminating rattles.

HOOD STAY

The upper and lower hood stay brackets are (factory) attached as shown.



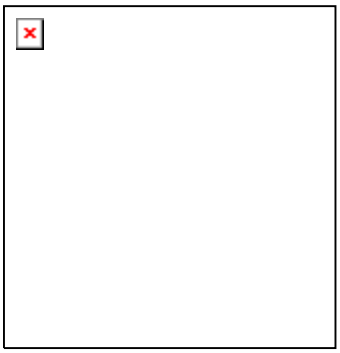
fiat\man\e\Hoodprop

If you removed the **keyhole receptacle** from the hood inner panel when it was painted, install as shown.

The plastic rod retainer fits into a square hole in the wheelhouse panel. It may be removed by squeezing from the backside.

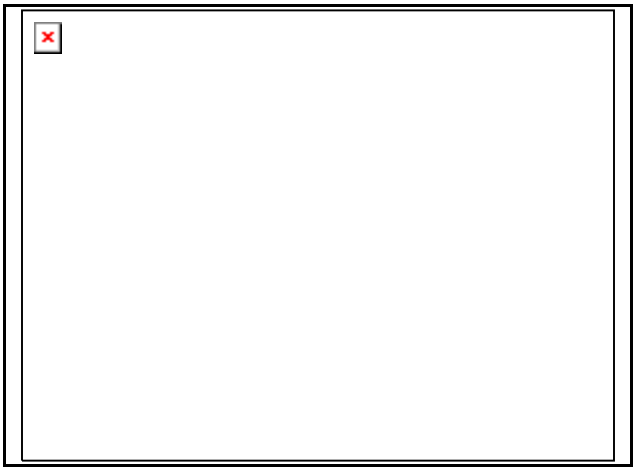
TRUNK LID

Install the trunk lid liner (the fuzzy stuff that was with the optional "street" carpet kit) onto the inside of the trunk lid with contact cement. Trim the material so that it can be pushed just under edge of the fiberglass inner panel.



Glue the half-round **weatherseal** provided with the kit onto the trunk opening flange of the body, leaving about $^{1}/_{8}$"-$^{3}/_{16}$" distance between the edge of the seal and the up-curve of the outer lip. To keep from making a mess with the contact cement, you can use masking tape to border where the weatherseal will be placed.

Do not stretch the seal while installing. Start the process at the center of the bottom lip, in front of the latch. Continue over the top and back down to the center. Trim the excess so that the ends meet tightly. See the picture on page 91.



ebod\TRNKSEAL

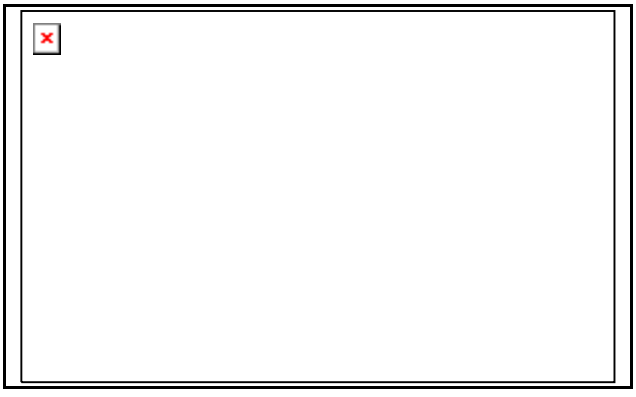
Bolt the trunk hinges (they are marked with a **T** on the lid side) loosely onto the body with any shims found earlier.

Loosely bolt the trunk lid (with factory shims) onto the hinges. Carefully close the lid, not letting the front edge contact the body. Center the lid in the opening. Slowly lift the lid just enough to get your arm (and a wrench) inside and snug the bolts on the lid part of the hinges. Remember to check the front edge while lifting lid.

The lid can be adjusted further by moving the lid and hinges in unit at the connection on the inner panel. Tighten bolts and recheck fit.

TRUNK STAY

Attach the trunk stay to the trunk lid as shown, using the sheet metal screws at the bottom, stainless steel dome head screws at the top.



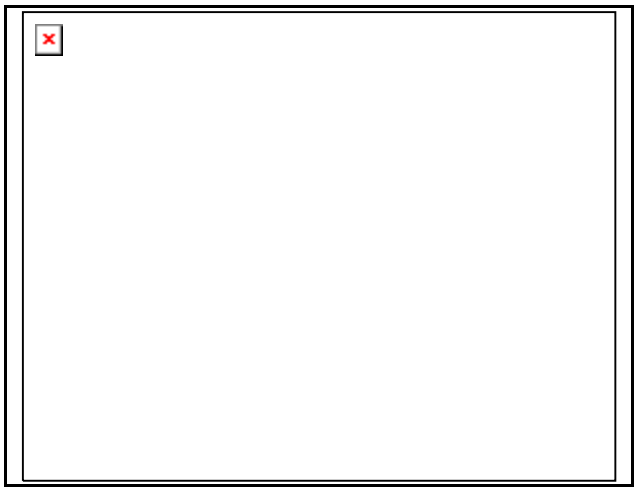
ebod\trnkstay

TRUNK LATCH

Attach the trunk handle and latch to the trunk lid as shown. Don't forget the gasket under the handle.

Attach the latch striker and bracket to the trunk floor.

Adjust the striker on the bracket so that when latched the lid slightly compresses the gasket and sits flush and centered on the surrounding body.

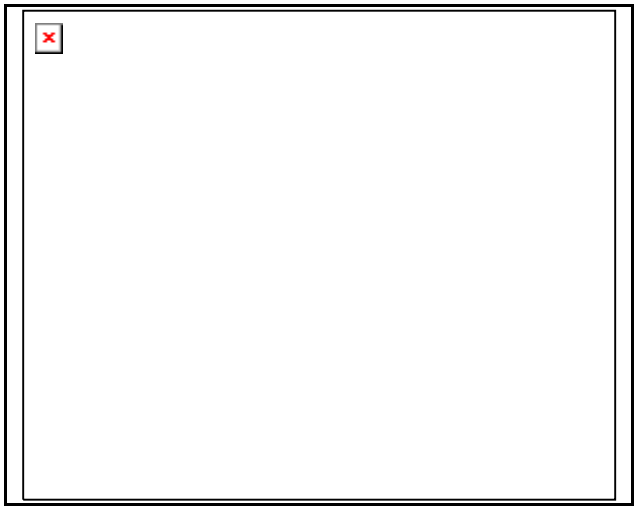


fiat\man\e\trnkltch

REAR CLOSING PANELS

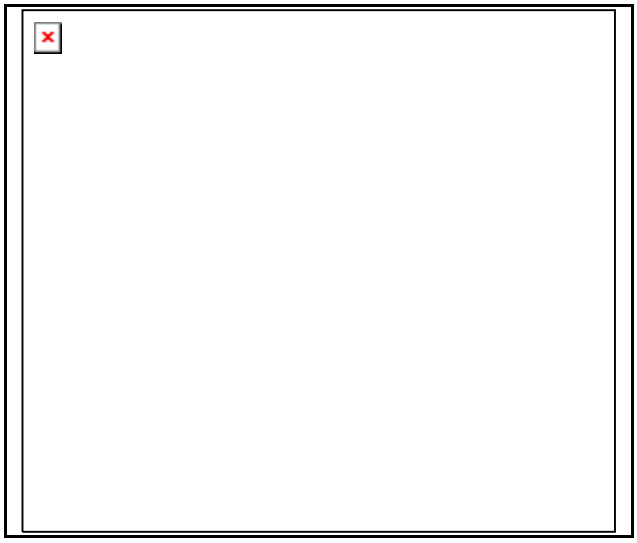
Install the panels that seal the rear wheel area from the passenger compartment with sealant and rivets.

Hold the panels in place with the original screws and drill ($^{9}/_{64}$" holes) for $^{1}/_{8}$" rivets into the chassis vertical tubes and the bottom outrigger. The closing panel with the bulb trim should contact the outer body lightly. If you want, complete the seal with urethane or silicone sealer.



fiat\man\e\RCLSPANL

ROLL BAR

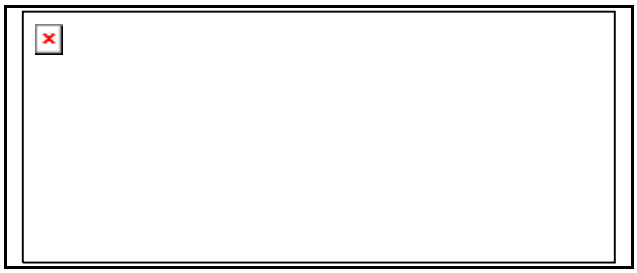


E\rollbar

When installing the bar (after paint), partially slide the rear hoop into the chassis. About an inch before fully seating the hoop, install the front brace.

RADIATOR, FANS

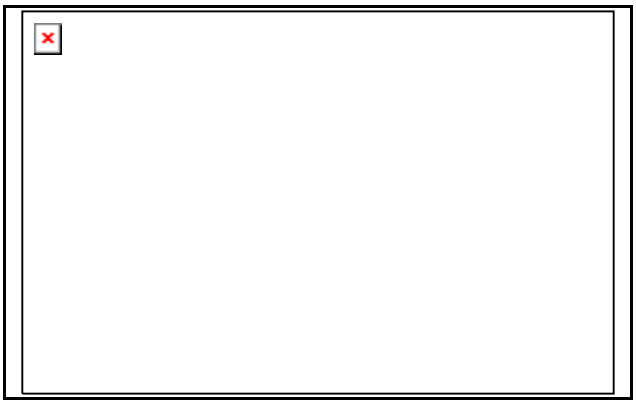
The radiator can be installed from underneath the car or from the top if the hood is not installed. Insert the rubber radiator grommets into the holes in the radiator support tray.



fiat\man\e\lradmt

From the bottom: Raise the radiator/fan unit and tray up into place over the **front chassis studs**. Hold in place with nuts, lock washers and flat washers. Check that the radiator is centered in its mounts. **Gently** let the radiator lean back against the chassis.

From the top: Install the bottom tray onto the chassis. Carefully slide the radiator down into grommets.



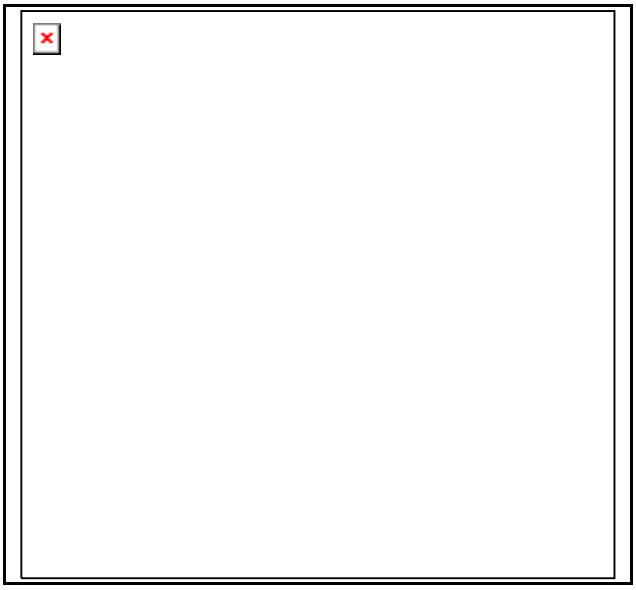
fia\man\e\radmt

Fit the rubber grommets and steel sleeves to the upper radiator support. Install the support over the studs on top of the radiator with the large washers, lockwashers and nuts.

Move the radiator forward and attach the support to the body. Attach the support straps (or optional rear fan, see below) between the upper and lower radiator supports.

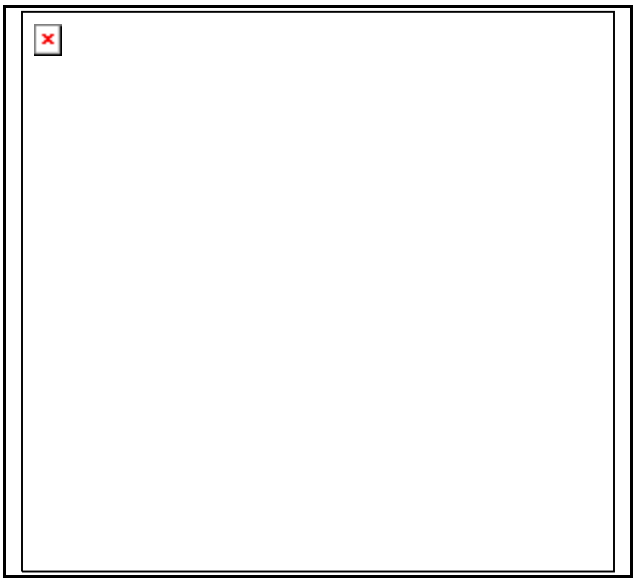
OPTIONAL FANS

STANDARD



fia\man\e\stdfan

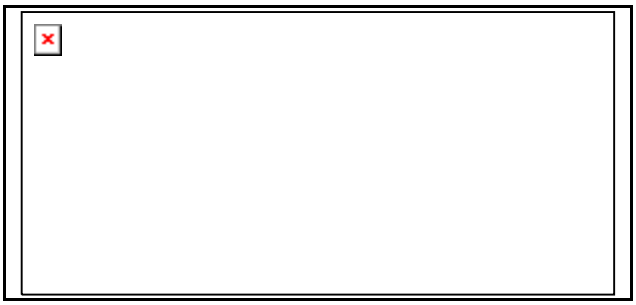
15" REAR MOUNTED



fia\man\e\optfan

HOSES

Mounting for the optional expansion tank is shown on page 34. lnstall the radiator into the chassis as shown above. The hose part numbers and instructions for modifying the front lower hose are covered on page 34. Note that a connecting tube (availble from ERA) is required for the upper hose. Assemble the upper hose as shown on page 35.

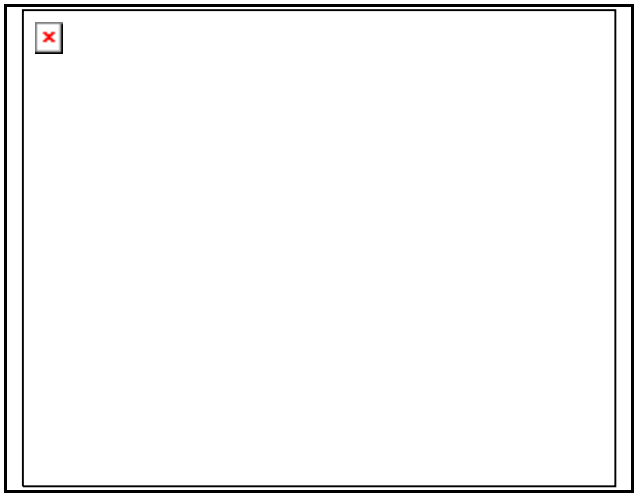


fiat\man\e\lwathose

The radiator cooling fan thermostatic switch is in the lower hose connector. Connect the harness wires as shown on page 85 and detailed in the wiring instructions. (There is also an over-ride switch on the dashboard).

RADIATOR SHROUDING

Attach the bottom radiator shroud to the 2 middle holes in the front edge of the radiator tray as shown. Install the left and right shrouds on top of the bottom, using the same lower screws. **Note**: If you are installing your own (not E.R.A.) oil cooler, the shrouding panels must be modified. The E.R.A. oil cooler comes with pre-drilled shrouding.



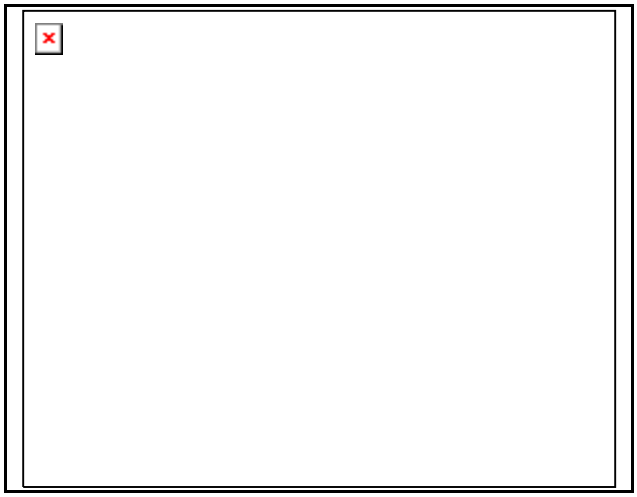
fiat\man\e\radshrd

OIL COOLER (OPTIONAL)

***ALWAYS** clean the hoses, adapters and fittings before you add oil to the system.*

It may take some time to fill the lines and cooler with oil. You might want to get initial oil pressure with an oil pump driver through the distributor hole.

RETROFITTING



Remove the bottom baffle and seal.

Install the edge retainer to the bottom radiator support.

Attach the oil cooler to the bottom tray with ¼" bolts.

Install speednuts onto the top flanges of the cooler, threaded side down.

Install the sides over the top speednuts and connect to the bottom tray through the side hole.

Temporarily install the assembly, fitting the front tabs on top of the fiberglass scoop and the rear flange of the side pieces against the radiator tray.

Drill through the fiberglass with a $^{5}/_{16}$" drill and hold the assembly in place with the Allen screws provided.

Carefully drill through the rear flange of the side plate and the radiator tray, taking care not to damage the radiator, if installed.

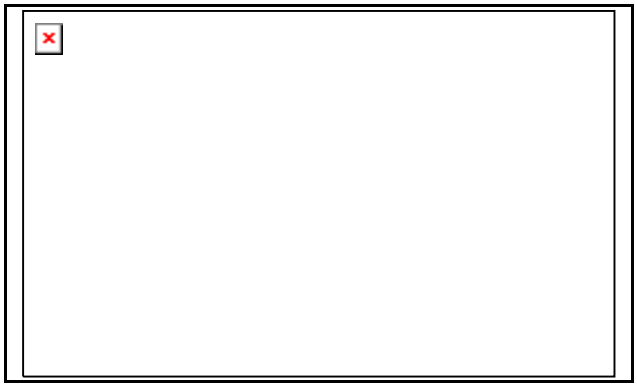
Fit the front fillers against the front flange of the side plate. Trim the bottom edge to match the body contour.

Remove the assembly and match the outside baffles to the side plate. Drill through the outside baffle and the side plate with a ¼" bit.

Drill through the front filler and side plate with a #30 bit. Redrill through the front filler afterward with a ¼" bit.

Reinstall the assembly, holding the pieces together with #8 sheet metal screws.

Place the top (curved) shroud between the top side of the bottom edge of the body opening and the slot in the front of the radiator tray.

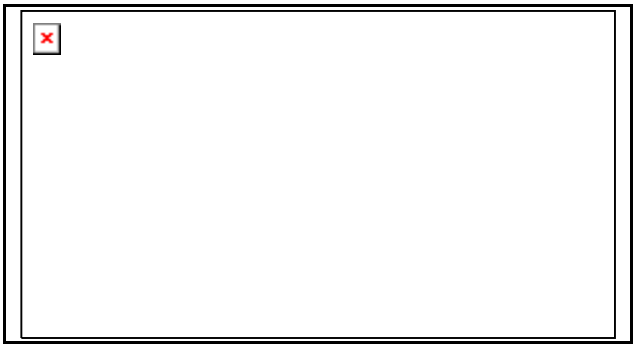


fiat\man\e\oilcooler1

Mount the oil cooler on the shroud.

Connect the hoses to the adapter and cooler as shown below. Use Teflon tape or pipe joint compound on the threads.

The adapter housing mounts onto the engine filter housing using the substitute fitting included. The oil filter mounts on the adapter as shown on page 94.

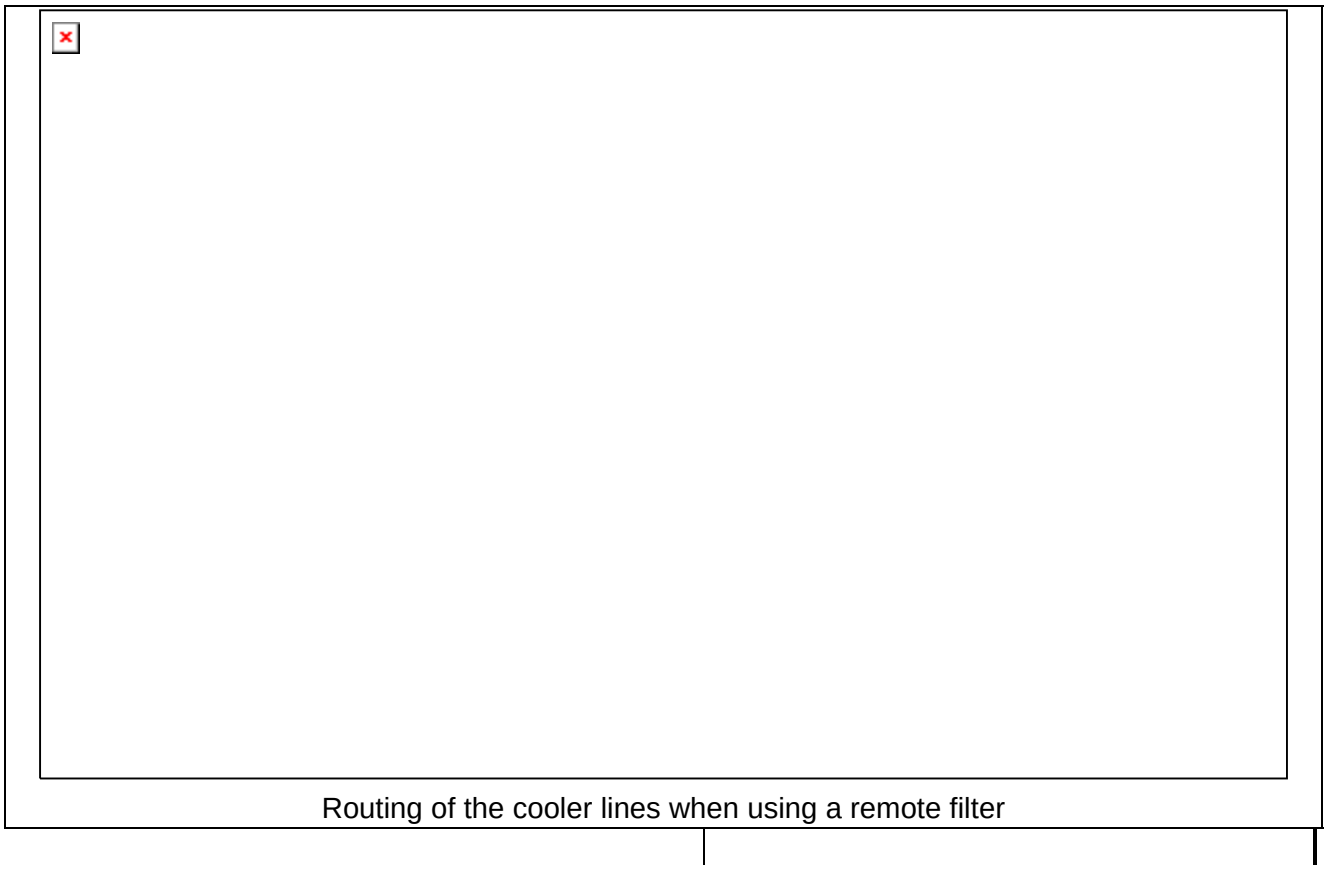


fiat\man\e\oilcooler2

Fit the rubber grommets onto the lines first. Then pass the lines through the shrouding, tweeking the grommets into the holes with a blunt screwdriver, etc.

The longer oil cooler line runs from the right side of the cooler alongside the radiator and is tie-wrapped to the bottom of the upper control arm inner pivot, then through a clamp on the front of the oil pan to the right fitting on the adapter housing.

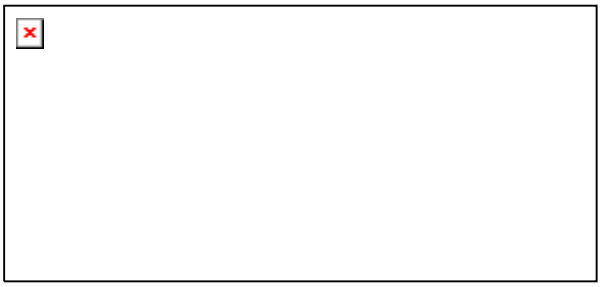
The shorter line runs along the left side of the radiator, is tied to the control arm pivot, goes below the steering shaft and to the left fitting.



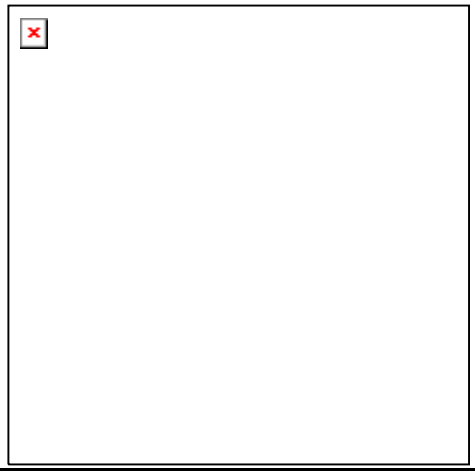
Routing of the cooler lines when using a remote filter

FUEL TANK

FIA



Slabside



The aluminum fuel tank (FIA-19 gallon, Slabside – 15 gallon) is located above the rear suspension, at the front of the trunk. It is fully baffled, with one-way doors separating the volume into thirds. The outlet is on the bottom, centered at the rear. The fuel level sender is mounted on the top, with a wiring harness leading down toward the left side of the tank where the connection to the main rear harness takes place through the access hole.

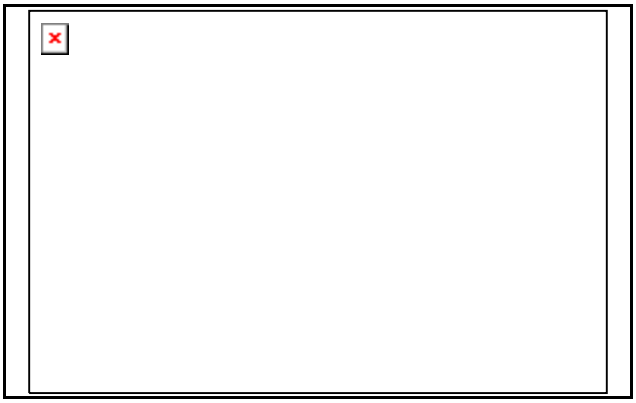
REMOVAL/INSTALLATION

Remove the large access panel at the front of the trunk, and the small filler on the right side.

Remove the rear wheels and the access panels behind them on the inside splash panels.

Remove the fuel filler cap. See page 53.

Remove the nuts on the tank retaining strap. See below.



e\fueltank

From underneath the car, disconnect the fuel line at the tank (if the tank is empty) or the connection at the steel line at the right side if there is fuel. Pinch off the line before disconnecting, or empty the tank first!

Remove the supports between the tank and the small tube underneath the rear edge of the tank.

Connect the fuel outlet on the center rear of the tank to the steel line on the chassis (both $^{3}/_{8}$" OD) with a length of rubber fuel line. An in-line fuel filter can be conveniently installed within this section of line. Use clamps on all connections.

FUEL FILLER CAP

FIA

*To **remove the fuel tank**, you can remove the cap, flange and sleeve as an assembly.*

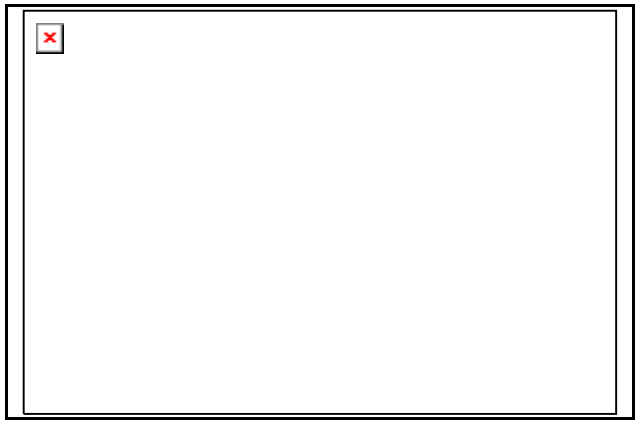
REMOVAL

The filler cap will always screw on with the same orientation to the flange. If you are going to remove the cap and outside flange or extension from the tank, **mark the inside** of the flange so that it can be assembled with the same orientation to the tank.

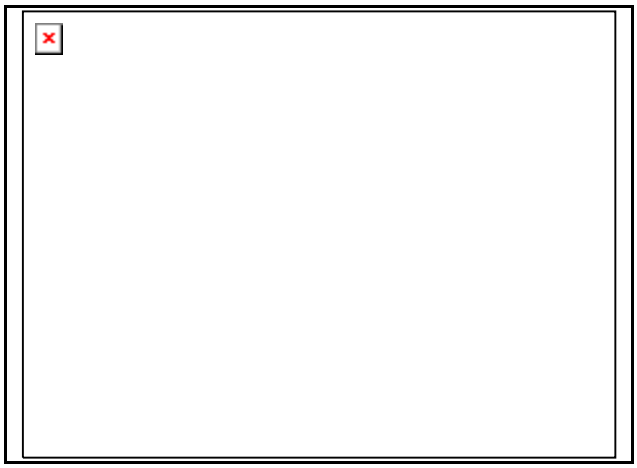
Remove the inside cap.

Unscrew the cap with "O" ring from its mounting flange. The threads are coated **with anti-seize grease**. If you have to remove the coating**, it must be replaced** before reassembly. Without it, the parts may gall together permanently.

INSTALLATION



fia\man\e\fuelfill



G\wipmt

SLABSIDE

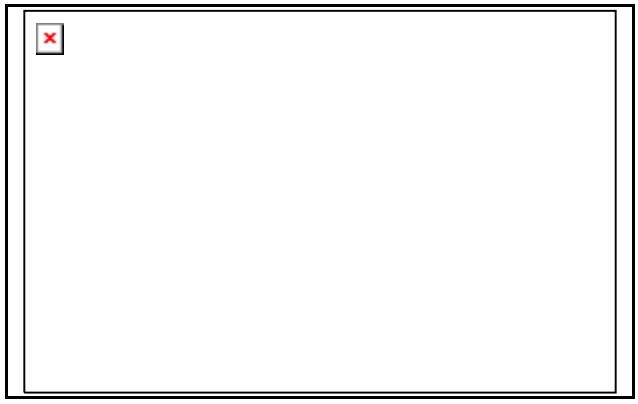
Slabside filler cap: *See page 53.*

WINDSHIELD WIPERS

Prepare the wiper motor and other components as described on page 47.

INSTALLATION

Insert the wiper wheelboxes (up through the holes in the cowl with the cable guides down and forward. It may be necessary to cut about $^{1}/_{8}$" from the drive spindle spacer sleeve to compensate for the extra thickness of the fiberglass body. Install the gaskets, bezels and nuts but don't tighten the retaining nuts.



e\wheelbx

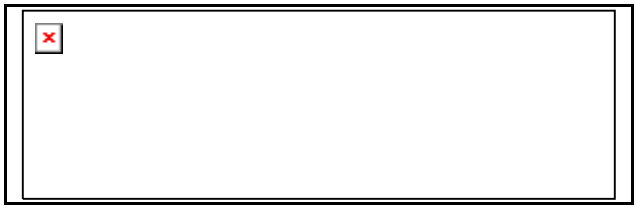
Loosen the nuts holding the cable retaining plates to the wheelboxes.

From the engine side of the firewall, push the tube from the wiper motor to the right wheelbox through the grommet.

Fit the cable tubes to the wheelboxes so that the flared ends of the cable tubes lock into the slots on the wheelbox housing and back plates. Leave the retaining plates slightly loose so that the tube orientation may be adjusted. The short tube on the left gearbox is to support the surplus cable outside the left wheelbox.

If necessary, gently bend the tubes to create a continuous curve from the motor through each wheelbox. Be careful not to kink the tubes. Check by sliding the drive cable through each tube after bending.

Loosely attach the nut on the right cable to the wiper motor. See the illustration on page 45.



fiat\man\e/wiper2

Coat the wiper drive cable with lithium grease and slide the wiper drive cable into the tube. Secure the wiper motor in the receptacle with the clamp and insulators provided.

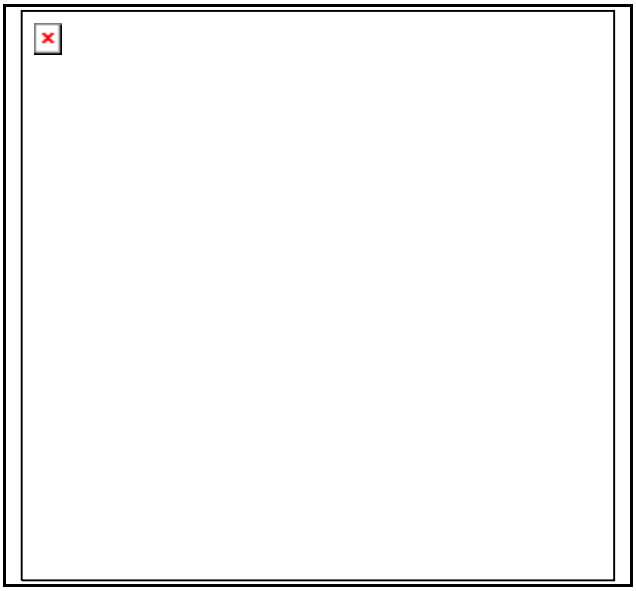
Tighten all the wheelbox nuts and the tube nut to the motor.

Install the wiring harness plug.

Don't install the wiper arms to the splined drive spindles until the motor has been run and the park (resting) position has been found.

WINDSHIELD WASHER

The optional windshield washer uses a manual pump like the original Cobra. If ordered with the kit, the fluid container and the pump unit are installed at the factory. If you are retrofitting your car see below for the fluid container and pump mounting locations



Washer

Fit the fluid container bracket to the right side of the firewall as shown.

Mount the washer jets into the predrilled holes on the cowl, jet noses aimed toward the right. If you are retrofitting, it may be necessary to grind the underside of the body for thread clearance.

Mount the pump in the dashboard. The location is shown on page 102.

Pass the plastic tubing from the fluid container cap through the $^{5}/_{16}$" hole in the firewall as shown.

Cut the tubing supplied into pieces to connect components as shown above. Leave a little extra length so that the tubing can be secured to the wiring harness and/or the wiper tubes with wire or tie-wraps.

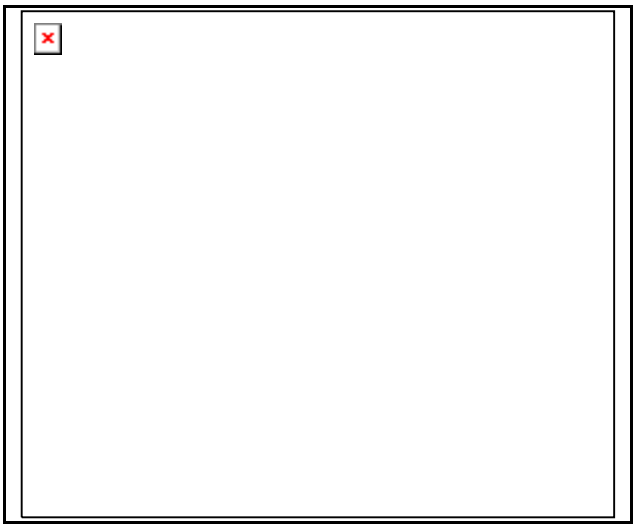
WINDWINGS AND SUNVISORS

The windwings and sunvisors are pre-installed with the street-car option or can be retrofitted to a comp car. They can be attached to the windshield frame before or after the windshield is mounted on the car.

***Caution**! Be careful when installing the screws into the windshield frame. If the screws contact the glass, they will break the windshield. Check the screw length and clear out the holes before starting. Install using the diagram below.*

WINDWINGS

Remove the bottom and third screws holding the windshield frame to the windshield.



e\windwing

Compare the length of the two new screws provided with the original screws by inserting into the mounting blocks on the windwing mounting brackets. Grind off any excess length. **If the screw hits the glass, the windshield will be cracked. Double Check.**

Install the screws with medium strength thread locking compound.

SUNVISORS

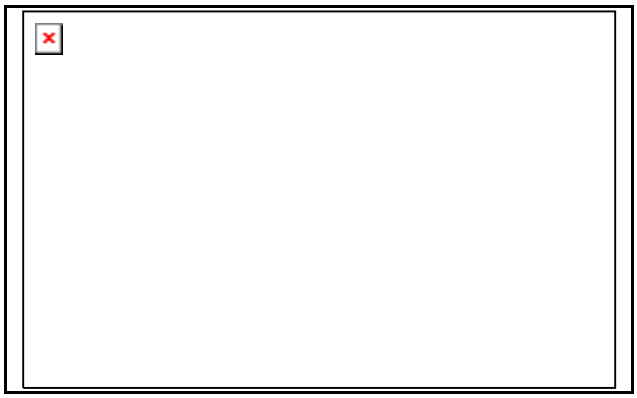
With a small stiff wire, clean out the holes tapped in the upper windshield frame.

Push the wire to the bottom of the hole and mark where it is flush with the windshield frame surface. Check each hole to make sure they are all the same.

Check the hole depth against the length of the chrome 6-32 oval head screws used to attach the angle brackets to the windshield frame. Shorten the screws if necessary. **If the screw hits the glass, the windshield will crack! Double Check.**

Attach the angle brackets to the windshield.

Loosen the sunvisor mounting block set screws. Slip the blocks onto the angle brackets and tighten the set screws.

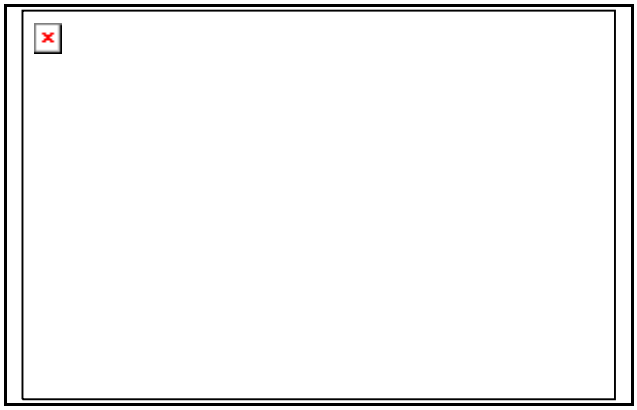


sunvisor

HEATER-DEFROSTER

*Close the water **shut-off valve** when the heater is not required. The heater will radiate some heat even if the fan is off and the doors shut. Definitely not necessary during those hot and hazy days.*

When ordered with the E.R.A. kit, the optional heater/defroster system is already mounted behind the dash as shown below.

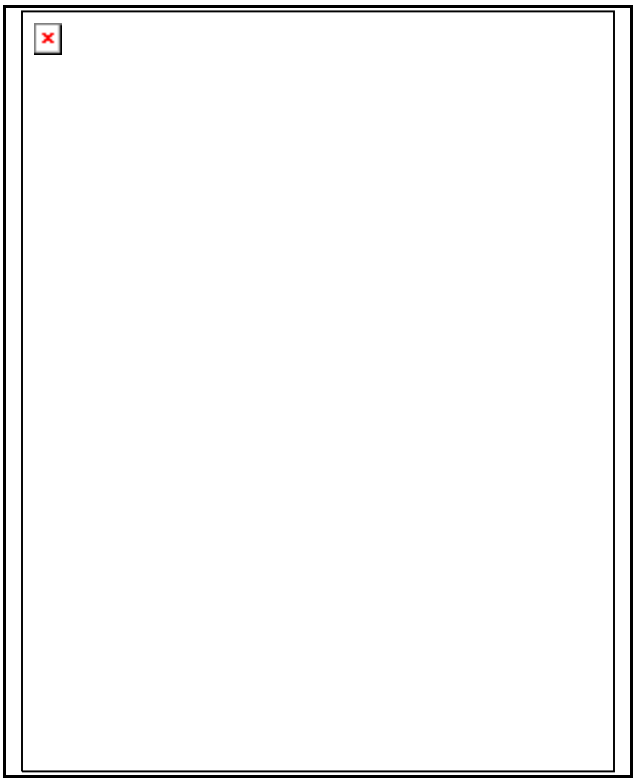


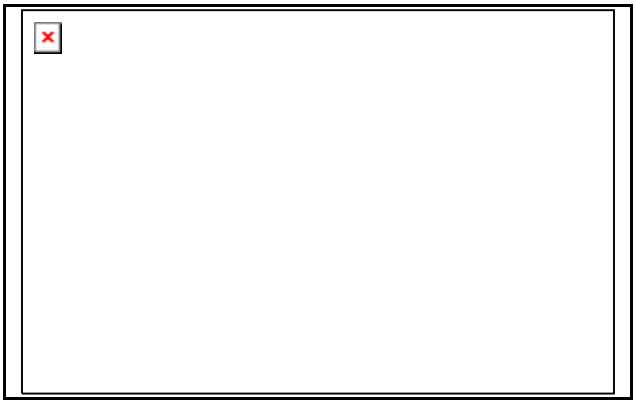
e\heater

See thermostat note on page 34.

E.R.A. 289FIA uses what would have been the original heater switch for the radiator fan over-ride function. You may install another toggle switch at either end of the row of toggles, or drill a hole in the bottom of the heater case and mount the two speed switch supplied with the heater there (the wires must be re-routed, but this makes a very clean installation.)

Hose routing is dependent on the several different intake manifold choices. The routing above is necessary when the intake doesn't have a second boss for the tap. Otherwise, the routing below can be used. You should use a valve in the system for either method.





wiring\heat2sp

TO RETROFIT:

Use the template included with the heater to drill holes in the firewall.

Bolt the heater in place as shown, using nylon locking nuts. Connect the motor ground wire to the steering column mounting bracket or some other ground.

Install the water shut-off valve in the water outlet of the intake manifold ($^{3}/_{8}$ NPT fitting). Use Teflon joint compound or tape on the threads.

Cut the heater hoses to length. Connect the lower tube on the heater (inlet) to the shutoff valve. Connect the upper heater tube (outlet)to the fitting on the water pump.

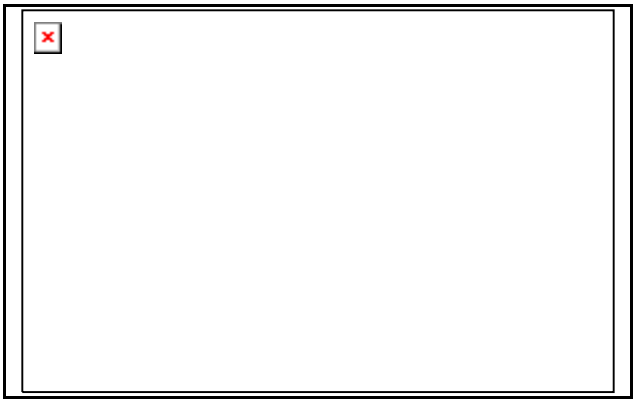
Connect the blower motor wire to the dashboard harness as indicated in the wiring instructions. See the wiring hints above to use the two speed switch.

WINDSHIELD

Slip the aluminum trim plates onto the windshield posts with the convex side up and the screw holes to the outside.

Fill the underside of the trim plates with sealer or ribbon-type caulk to make a water tight seal between windshield post and body.

Lower the windshield into place. Replace any shims between the posts and the chassis and install the large flat washers, lock washers and bolts. If you are going to use side curtains, leave the bolts loose to adjust the windshield rake to match the front edge of the curtains:



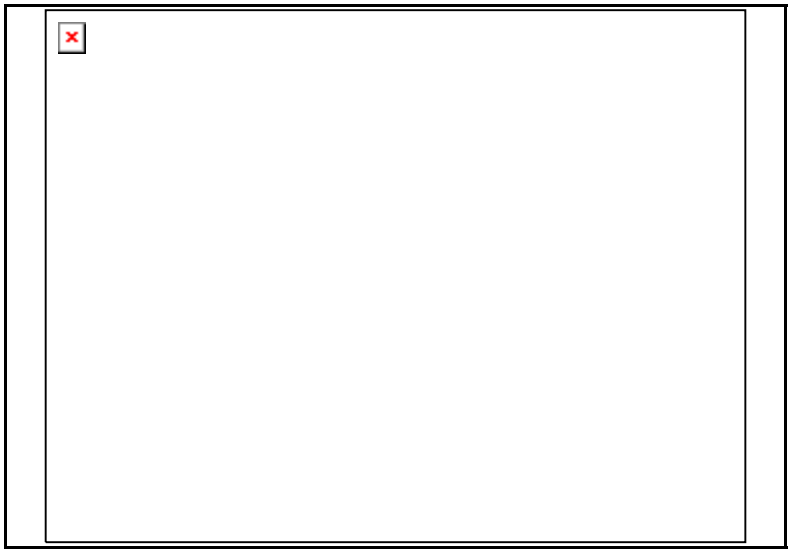
e\windshld

WITH SIDE CURTAINS

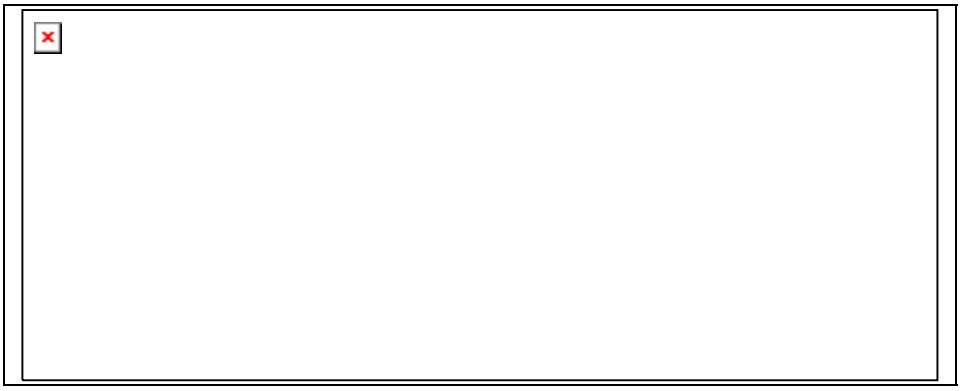
See curtain installation on page 122. Angle the windshield back so that the front edge of the side curtains slip inside the windshield posts and are parallel with the windshield. See the illustration on page 101.

Tighten the outside mounting bolts and fasten the center bracket with two #8 self-tapping screws.

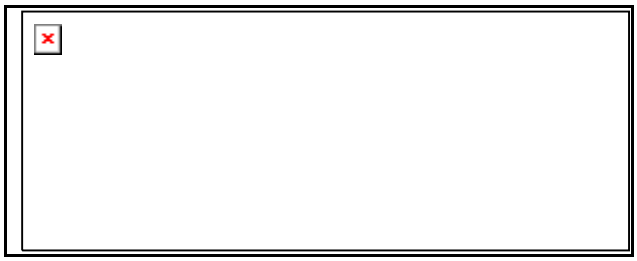
DASHBOARD



e\dashlay



If you are using the **rotary (street) wiper switch**, install the wiper relay on the firewall before the dash:



The dashboard wiring connections can be done off the car, with the dashboard resting face-down on something soft. Follow the separate wiring instructions for individual connections.

INSTALLATION

Remove the tape wrapping the fresh air cables and let the cables lay on the floor.

Attach the (optional) windshield washer tubing to the pump. Hold the dashboard in place on the body and loosely thread in the mounting screws and trim washers. Don't install the extreme right-hand screw and leave the rest of the screws loose so that the glovebox can be installed.

GAUGE HOSES

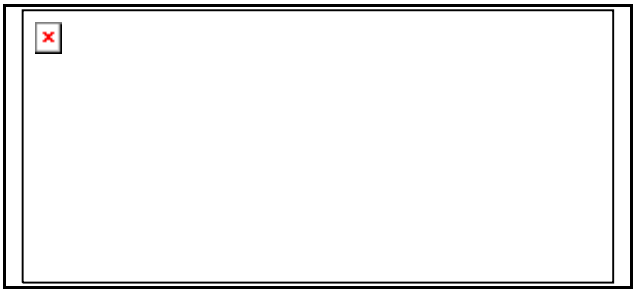
Pass the lines through the holes as shown on page 85. Run the oil pressure line along the left side of the engine compartment (with the wiring harness) and down along the corner of the wheel well. Connect to the block just in front of the oil filter boss. If the original extension is still there, the plastic line can be attached there. Otherwise, run the plastic line right to the block. Some race clubs require metal line between the block and the gage.

GLOVE BOX (OPTIONAL)

*For **theft prevention**, you may want to put a **kill switch** in the glove box. See the wiring instructions for electrical details. Drill a hole for the switch in the upper corner of the vertical section of the box, next to the door.*

Use contact cement to line the bottom and sides of the glove box with the **fuzzy material** included with the carpet set.

Also glue a strip of material on the underside of the rear box edge where it meets the dash to prevent it from rattling against the transverse dash support.

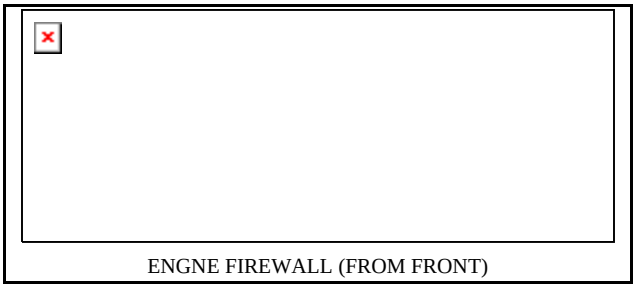


g\glovebox

Holding the glove box with its forward edge tilted down and towards the front of the car, slip its trailing edge up and under the glove box opening lip of the dash. Be sure that the edge goes under the glove box door mounting screws.

Raise the rear of the glove box into place and install the final dashboard screw. Tighten all the dash screws to hold the glove box in place while you attach its rear flange with the self-tapping screws provided. (A $^{1}/_{4}$" ratchet and a long extension makes this job easier). Attach the leading edge of the glove box with the two #4 trim screws at the sides of the glove box opening.

SPEEDOMETER CABLE (AND OTHERS)



ENGNE FIREWALL (FROM FRONT)

The holes are used differently with Comp and Street dashboards. Hole (B) is drilled when an MSD ignition box is mounted behind the dash.

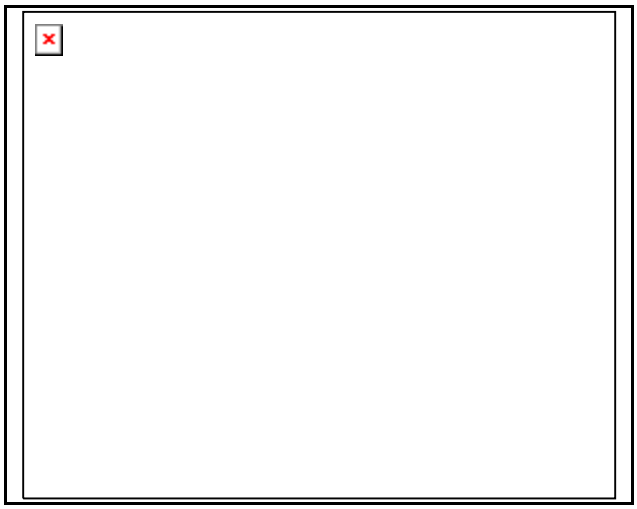
	Hole			
Dash	**A**	**B**	**C**	**D**
Comp	Speedo cable	MSD	Water temp	Oil Temp
Street	Water temp	MSD	Speedo cable	Oil Temp

There are several possible speedometer cable and drive location on the transmission. See page 12 for the right cable for your application.

*If you are using a **counter-rotating speedometer** with a Top-loader transmission, a cable reverser must be installed on the speedometer cable. With the **Richmond gear transmission**, the reverser is integrated into the right angle drive adapter at the transmission.*

INSTALLATION

From the engine compartment side, slip the smaller (speedometer) end of the cable through the rubber grommet in the footbox.



e\spcable

Feed the other end towards the rear over the bellhousing and down the right side of the transmission.

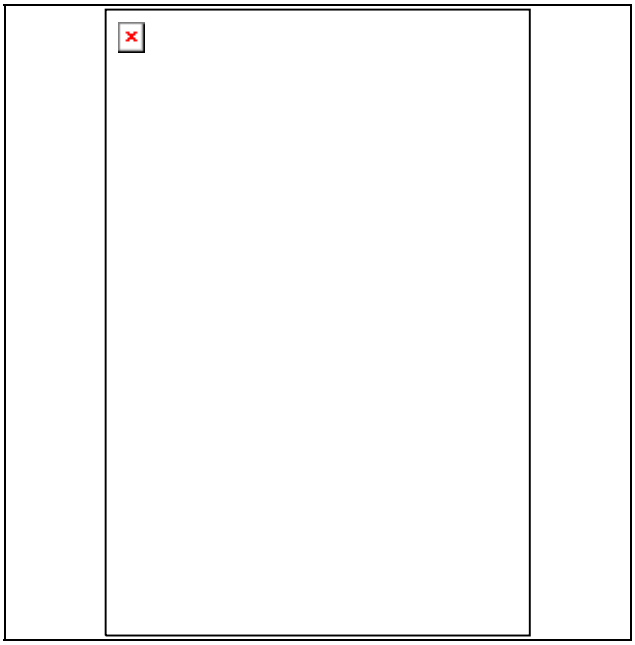
From inside the car, pull the small end through the grommet. Align the square end of the cable and its receptacle in the gauge, and tighten the retaining nut.

If the transmission drive is on the right side, run the cable through the hole in the hand brake lever mounting bracket. If the drive is on the left side, the cable must be kept from interfering with the shifting mechanism by attaching the cable to the side of the floor with clamps.

Secure the cable to one of the bellhousing top bolts.

Some cables or right-angle drives have been known to **have too much length** where they go into the speedometer head. This will either cause the speedometer to malfunction - or the gear at the transmission to strip. Check clearance by disconnecting the cable at the transmission end and insuring that it turns easily. If not, either shorten the cable where it enters the speedometer or add shims where the cable housing meets the threaded section on the speedo.

TKO CABLE ROUTING



BATTERY AND CABLES

The battery is mounted in a hidden compartment behind the right rear wheel. Installation of the **support tray** is described on page 79.

BATTERY

INSTALLATION/SERVICE

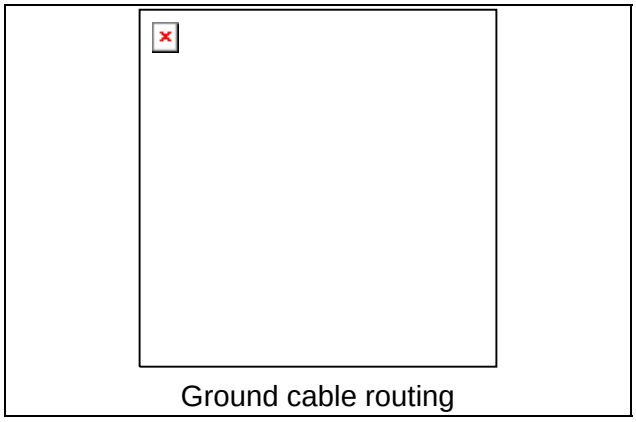
See the illustration on page 79.

If necessary, remove the right rear wheel.

Remove the screws and nuts holding the splash panel at the rear of the wheel well.

Place the battery onto the tray with the posts toward the outside (away from the chassis). The negative terminal with the latest batteries is at the rear. Attach the 135"long battery cable (use a 60" if you are using the cut-off switch (See page 79) to the positive terminal on the battery (toward the front of the car). The cable is routed around the back of the battery support. The power cable is then routed as per the instructions on page 68.

Attach the **ground cable** to the rear terminal. Secure the cable with a clamp at the back bolt. Fasten the eye to the front bolt.



Ground cable routing

Slide the hold-down rods up through the holes at the front and back of the bottom of the battery support, and through the holes in the corner bracket. Secure with lock nuts and washers.

STEERING COLUMN AND WHEEL

Before the Triumph steering column is installed, check that the signal canceling cam on the steering column shaft is oriented correctly. See page 44.

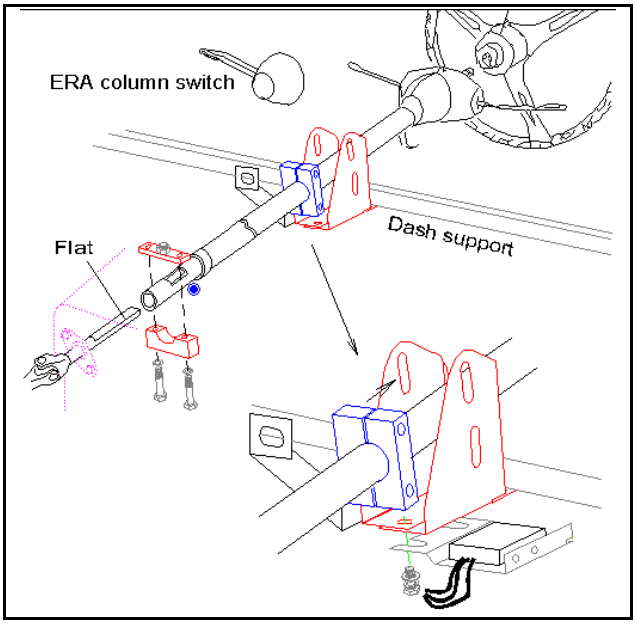
*The **steering wheel center cap** (see page 105) is installed after final suspension alignment.*

Lower steering column installation is described on page 104.

Prepare the triumph steering column as described on page 44.

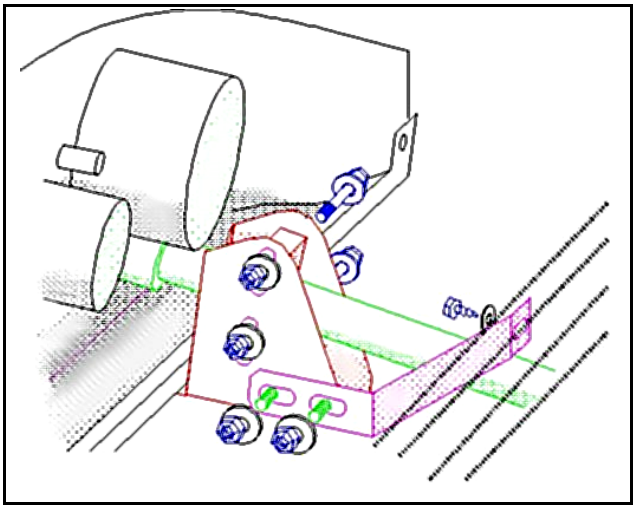
*The **steering wheel center cap** (see page 105) is installed after final suspension alignment.*

ASSEMBLY



Insert the upper column and housing through the hole in the dashboard, engaging the lower column as the upper one is slid in.

Hold the clamp halves of the upper column around the column, oriented as shown, and slide the clamps together back into the mounting bracket. Insert the cross-bolts as shown below.



With the driver's seat correctly positioned in relationship to the pedals, slide the steering column and housing in or out to suit your driving position. Adjust the height of the column to your preference, and tighten the cross-bolts.

Align the flat of the lower column with the notch in the upper tube and fit the clamp over the column tube. Snug the bolts slightly but don't tighten.

Bolt the steering wheel to the hub. The pattern is asymetric - the parts will only fit one way.

With the road wheels straight, install the hub on the column with the washer and nut. Torque the nut to 25 lb-ft **only after the suspension is aligned** and the steering wheel position is determined to be correct.

Move the steering column in or out relative to the housing until there is $^{1}/_{16}$"- $^{1}/_{8}$" clearance between the bottom of the hub and the top of the column housing or signal switch (E.R.A. column). Tighten all the clamp bolts.

Mount the signal/flasher relay onto the bottom of the column mounting bracket as show above. Connect the steering column wiring (horn, signal lights, headlight dimmer) as shown in the wiring instructions.

Secure loose wires with cable ties or tape.

STEERING WHEEL REMOVAL

Carefully pry off the center cap, and remove the nut and washer.

While keeping rearward pressure on the steering wheel/hub, strike the end of the steering column forward with a brass or lead hammer. Be carefull not to damage the threads. If that does not disengage the taper, use a steering wheel puller.

CENTER CAP

The optional cap is held in place with 3 clips. Be **very careful** not to scratch the back surface of the cap. It will show on the outside.

SHIFT LEVER

The shift lever boot and chromed trim ring are provided in the kit. A Mustang shift lever can be adapted to most transmission to duplicate the original look. Inquire.

The shift lever may be mounted in several different locations, depending on your transmission. If your Top-loader mounting matches the diagram on page 15 or you have a Richmond Gear 5 speed, E.R.A. makes adapters to move the linkage to the proper position.

TUNNEL

*If you are using a **backup light**, use a transmission mounted switch actuated by the reverse gear lever. The wires can be attached to either terminal.*

If your tunnel is not pre-riveted, use 1/8" x ¼" long aluminum body/steel mandrel rivets. If you are not going to cover or insulate the tunnel, you may want to use urethane sealant between the panels.

SHIFT LEVER HOLE

The hole location marked on the tunnel is the correct location for the original-type shift lever. Your location may need slight adjustment to match your transmission's lever, especially if you are using a T-5 or Tremec with integral shifter.

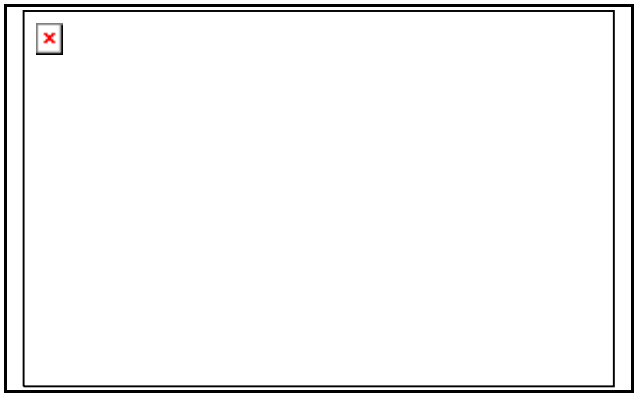
When the transmission is installed in the car, measure from the side and back to the base of the shift lever.

Temporarily remove the lever and mount the tunnel in the car. Mark the shift lever location on the tunnel. Cut the hole for the shift lever a little undersize, and refit the tunnel to check the location.

ACCENT TUBE HOLES

These non-structural tubes duplicate the look of the dash support tubes that were used on the original 289. Our tubes are held at the top by a bracket mounted on the firewall, at the bottom by the tabs or grommets in the tunnel.

Paint the tubes gloss black and install after the dashboard is in place. They can also be covered in vinyl.



fiat\man\e\tunltube

*The (optional) **ashtray** is installed into the tunnel at the factory. For retrofit, call us about the location. Cut the tunnel (and carpet) hole slightly smaller than marked and file to fit. A snug fit is all that holds the ashtray in place.*

INSTALLATION

With the tunnel held in place with the shipping screws drill 9/64"- holes 4"-5" apart along the length of the bottom flanges and through the floor. Also drill two holes, one on either side, through the vertical surfaces at the front of the tunnel near the top.

Enlarge the holes in the tunnel to 1/4" so that the hold down screws will drop through.

Insulate the inside of the tunnel. Use contact cement to fasten aluminum foil backed jute, foam or high temperature material (see page 25) on all surfaces except for the areas of overlap at the front edge and the bottom flanges. Check for adequate clearance along the left side of the tunnel adjacent to the shift linkage.

Glue low density foam weather-stripping (the same type used on edge of the wheelhouses) onto the bottom of the tunnel flanges.

Removal (after car is completed)

Remove shift lever, boot and bezel.

Remove seats

Remove dash support tubes

Remove the rear bulkhead access panel.

Remove screws along floor flange and lift the tunnel out.

CARPETS

LAYOUT

Installation details start on page 108.

INSTALLATION

The carpet installation diagram and general instructions are on page 107. All the exposed carpet edges are cut and bound. Unless specifically noted, are all **glued** into place. All the sections are glued onto the fiberglass or aluminum except for #16 and #17 which are held in place with snaps and Velcro©.

See page 109 for the emergency brake trim.

Two **supplemental** pieces are also included when the carpet is ordered:

- A piece of fuzzy material ($^1/_8$" thick) to cover the inside of the trunk lid. Carefully trim the piece (leaving extra material around the edges) and glue the center part of this on with contact cement. Carefully push the excess material under the lip of the fiberglass inner panel.
- A $^1/_{16}$" thick piece of vinyl to line the glovebox, also fastened with contact cement.

SPECIAL NOTES

(2,4) Trim sections **2** and **4** to fit under the door hinges as shown. The kit is shipped with shims under the hinges to compensate for the rug thickness. When the doors are finally installed, don't use the shims. Use an awl to locate the mounting holes for the dead pedal. Cut small holes for the screws.

(4) Remove the dead pedal (see page 83).

(10,11) Remove the door strikers, mounting brackets and any shims. Carpet sections **10** and **11** fit under the strikers with the front upper edge of the carpet folded out on top of the closing panel below the hinge.

Trim the excess rug on the door opening flange.

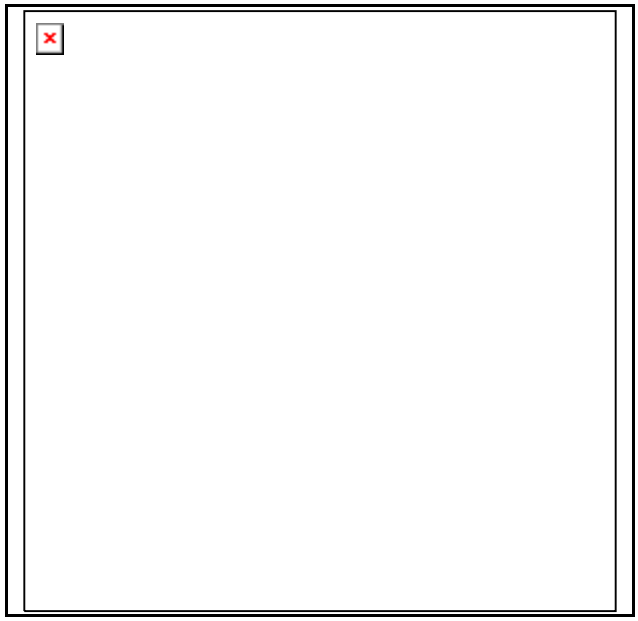
(10,11,14,15) Locate the holes in the carpet for the lap and shoulder belts if necessary. See the rug diagram and page 110.

(12) After gluing on the tunnel carpeting, cut holes for the dash tube grommets and install the grommets.

Install the dead pedal over the carpet as shown on page 83.

Attach the tunnel carpet (**12**) with about 1" extending past the front edge, allowing the carpet to be folded over to the backside and glued. Cut out for the shifter, ashtray and hand brake lever. Screw the tunnel into place.

To make cleaning easier, the front of the two-piece floor carpets are held in place with snaps and Velcro. Fit the carpets in place and mark the floor where the snaps are to go. Drill $^1/_8$" holes and screw the snap bases into place. Remove carpets to fit seats.



fiat\man\e\doorrug1

DOOR STRIKER ADJUSTMENT

Replace the door strikers as described on page 89. The added thickness of the carpet should make the rear edge of the door flush with the body. If not, add or subtract shims.

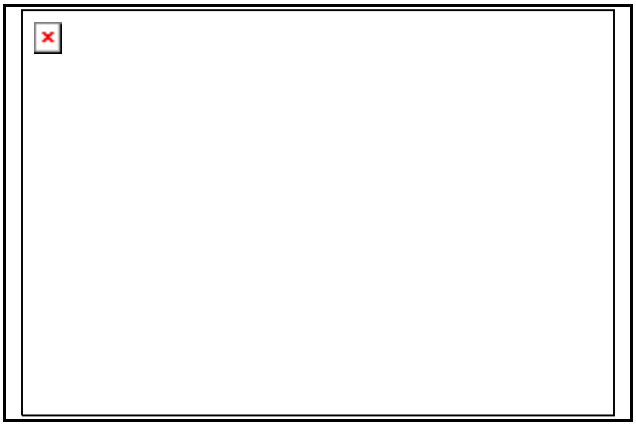
The door should latch on the second catch without being slammed. If it doesn't shut all the way with a solid "chunk", check for latch/striker misalignment, or interference between the two parts

To check for misalignment, hold the latch lever in the open position and shut the door without putting any pressure on it up or down. The door latch should seat into the striker without resistance or sharp contact sounds. Re-align vertically if necessary.

Open and shut the door several times, then check the striker receptacle of the latch for shiny spots. File these spots, being careful to hold the file flat. Recheck fit, and repeat the process if necessary.

FRESH AIR CABLES

The cables must be installed after the dash is installed.



fiat\man\e\rvent

LEFT

Lubricate the rubber grommet located midway up the front of the driver's footbox on the left hand side, with silicone spray or petroleum jelly.

Push the cable through the grommet and install the cable loop on the fresh air control valve as shown on page 59.

Attach the cable to the side of the footbox with a cable clamp.

RIGHT

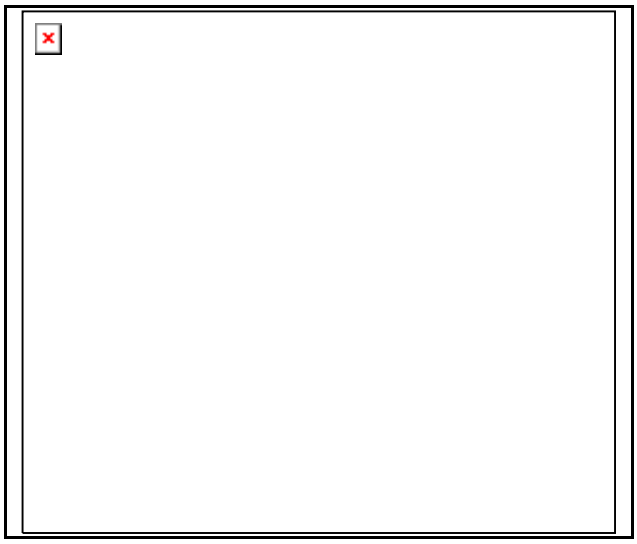
Insert the cable through the grommet in the upper right front of the footbox.

Attach the cable to the vent like the left footbox.

HAND BRAKE LEVER COVER

Using the figure below as a guide, open up the hand brake lever cover and align the cut-out section on the inside flap around the hole in the transmission tunnel behind the lever, bunching it up as necessary in the center. Attach the front edge of the boot by drilling holes through the fabric into the tunnel.

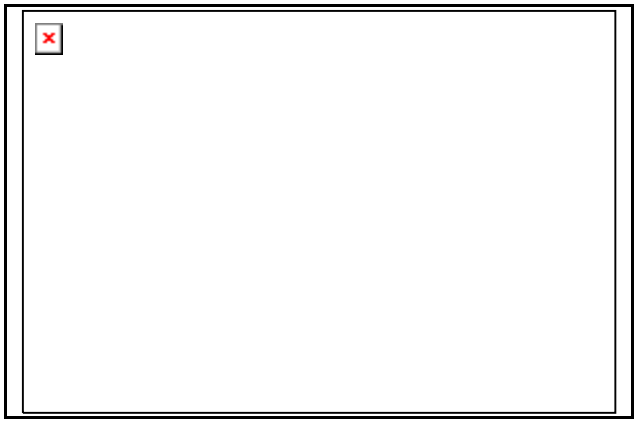
Hold the attaching plate against the cover and tunnel. Drill four $^{1}/_{8}$" holes into the tunnel. Attach the plate and cover to the tunnel.



g\ebtrim1

Re-bolt the hand brake lever in place.

Fold the outer flap of the cover over the lever and attach to the inner flap with the Velcro and snap.



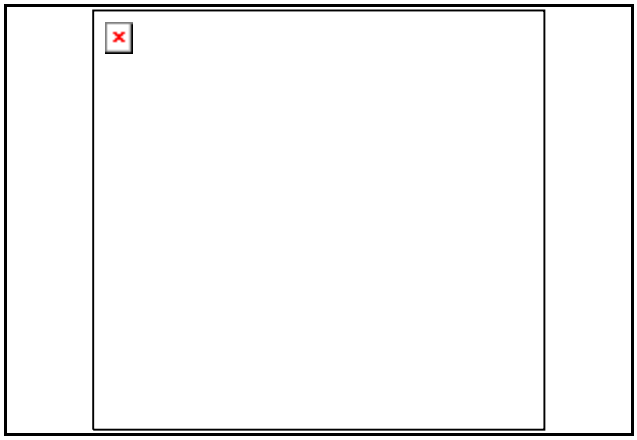
g\ebtrim2

Release the lever to the full down position, fold and tuck in the rear edges of the cover as shown. Fit the cover up against the tunnel, drill through into the tunnel through the holes in the cover and attach with the trim screws.

When the floor carpet is installed, lay it on top of the cover material extending out onto the floor.

SHIFT BOOT

Once the large hole in the tunnel is cut, locate the small holes by using the trim ring as a pattern as shown below. The adjacent holes are placed parallel to the car centerline.



After removing the shift knob, the rubber boot can be stretched over the "T" of the shift handle.

SEAT MOUNTING

Screw the seat belt anchors into the captive nuts provided on the lower chassis (see page 86). If necessary, clean the threads with a 7/16-20 tap to remove any paint build-up. If you have shoulder harnesses, cut holes in the carpet and, if necessary, chase those threads also.

Street interior: Lay the floor carpets in place, and locate the seat mounting holes through the carpet. Mark and cut holes for the bolts in the carpet.

If you are not using seat adjusting rails, each seat must be raised up approx. 3/8" with spacers to allow the cushions to drop into place.

WITH ADJUSTING TRACKS

The lever for the seat tracks falls on the right side of both the driver's and passenger's seats.

The seats have captive nuts for the adjusting tracks in the seat bottom. Install the adjustment tracks, if used, to the seat base first with 1/4-20 bolts. Put 1/8" shims under the three holes not covered with the tunnel. Place the seats so that the studs in the tracks go through the floor. Adjust alignment as below.

Loosely bolt the front of the tracks down (1/4-20 bolts). Slide the seat forward to expose the rear mounting holes and install the two rear bolts. Tighten all four bolts.

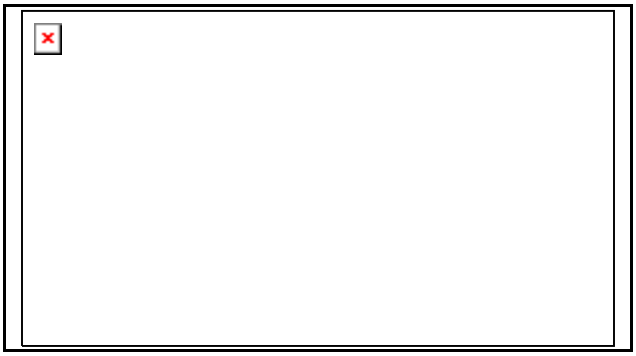
Slide the seat all the way forward and lubricate the tracks with white lithium grease. Slide the seat back and forth to distribute the grease evenly.

If the seat does not slide freely, loosen all four bolts, slide the seat back and forth to align the tracks and re-tighten. If seat adjusting tracks are not used, follow the instructions for type I seats for marking the holes. Spacers can be made of marine plywood cut to size and drilled for the bolts.

SEAT BELT/SHOULDER HARNESS

E.R.A. offers reproductions of the original competition belts. Inquire.

Locate the seatbelt holes in the floor next to the tunnel and in the rocker panels as shown. All threads are standard 7/16"-20.

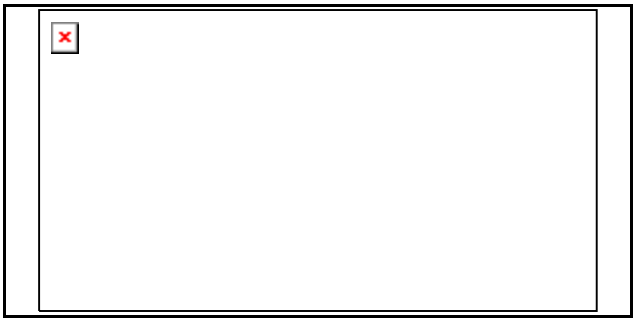


\SEATBLTH

Slip the ends of the belts in the clip to the eyelets of the anchors already in place.

SHOULDER HARNESSES

Locate the mounting holes in the chassis with an awl, and cut holes in the carpet if necessary. The optional four-point shoulder harness are installed with the (7/16"-20) attaching bolts above the belt loops.

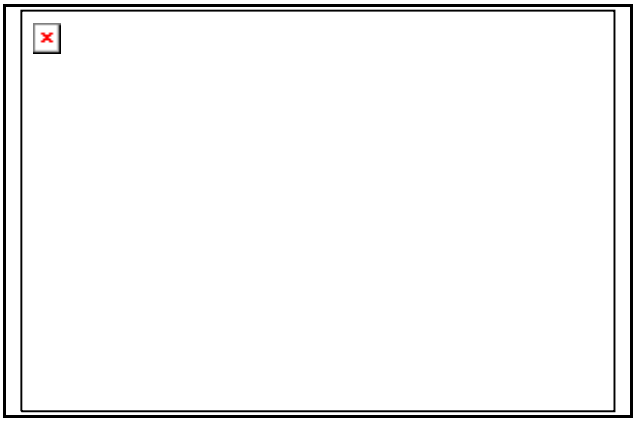


g\shouldh

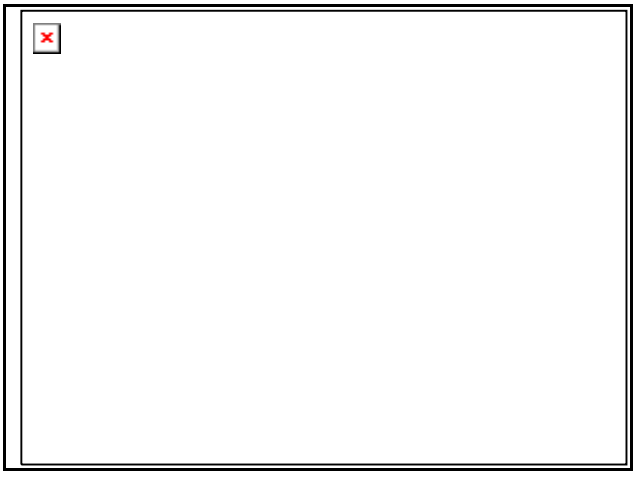
GRILL

If ordered with the kit, the grill is already installed. Retrofitting can be done as shown below:

Apply masking tape to the body lip along the inside (rear) edges as shown. If the body is already painted, use tape all around the inside of the opening to prevent damage while fitting.



Locate the lower holes by trial-fitting the grill in the body hole. Insert the grill past the likely mounting location and hold in the center of the body opening. Mark the pin locations onto the lower pieces of tape as a line projected directly forward. Check that the center-to-center distance between the holes in the body matches the pin spacing on the grill.

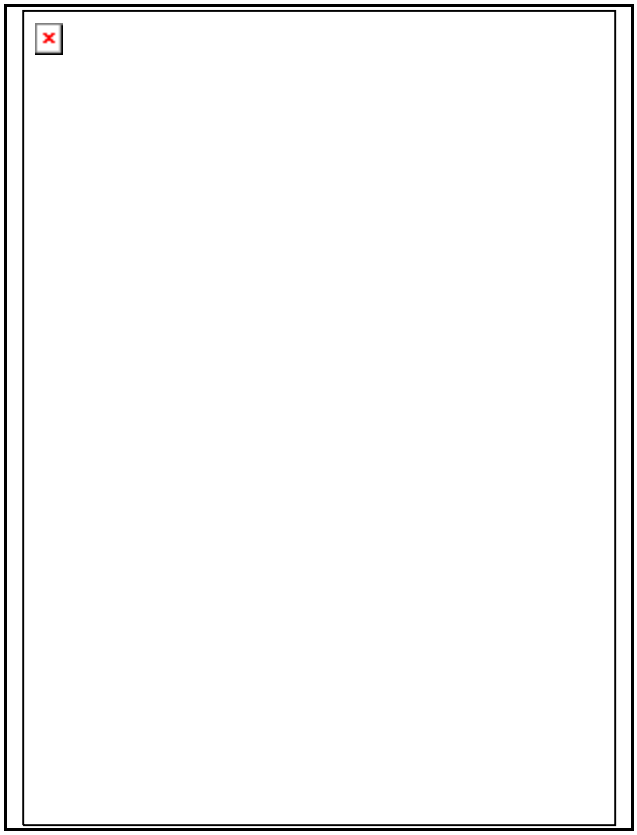


Measure back from the front edge of the body opening 1¾" and mark where that dimension intersects with the pin line. Check again, because that's where you're going to drill into the body. Use a small pilot drill and then finish with a $^{7}/_{32}$" drill bit. Drill straight down first, and then tilt the drill back about 20 degrees to make a tapered hole. Typically, the holes will fall about ½" from the lip edge.

Install the grill lower pins into the holes and rotate the top forward so that the top mount goes under the top body lip. You will have to push the grill down agains the rubber cushions to do this. Once in place, adjust the tilt of the grill to the top distance shown and drill two $^{1}/_{8}$" or #30 holes for the top #8 screws. Remove the tape and install permanently.

BUMPERS/JACK-PADS

The bumpers or jackpads are factory fit and installed. The aluminum spacer sleeves can be easily **polished** with very fine steel wool and/or car polish.



fiat\man\e\bumpers

INSTALLATION

Install the front and rear bumper mounts onto the chassis. Front mounts should have locating marks that were made when you disassembled the kit. Leave the mounting bolts slightly loose.

Fit the rubber grommets to the body. Be sure the lip is seated on both side of the fiberglass.

Fit the studs and spacers onto the **bumper uprights or jackpads**. Note that the upper spacers and studs are **longer** than the lower ones on both front and rear of the car. Leave the nuts loose if the nudge bars (hoops) are to be fitted.

Insert the bumper/jackpad assembly through the body grommets and secure onto the frame/bracket with a lock washer and nut.

If you have a rear **nudge bar**, the bar and uprights must be installed as a unit. The **front** nudge bar can be fitted separately or in unit with the uprights.

Align and tighten nuts and bolts.

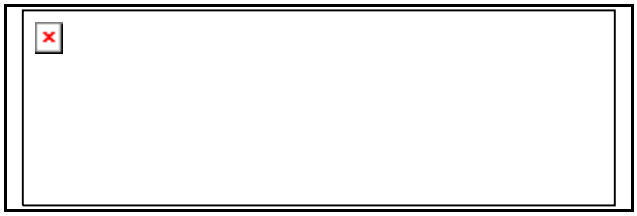
RETROFITTING THE FRONT NUDGE BAR

Tape the sides of the front uprights to prevent scratching and facilitate marking.

With the front uprights installed as shown above, hold the nudge bar between them, aligned with the body opening and with about $^{3}/_{4}$" clearance between it and the body.

Transfer the hole locations from the nudge bar to the uprights.

Drill $^{3}/_{8}$" holes in the uprights and install the threaded inserts with a special tool or a nut and bolt.



ebod\rivnut

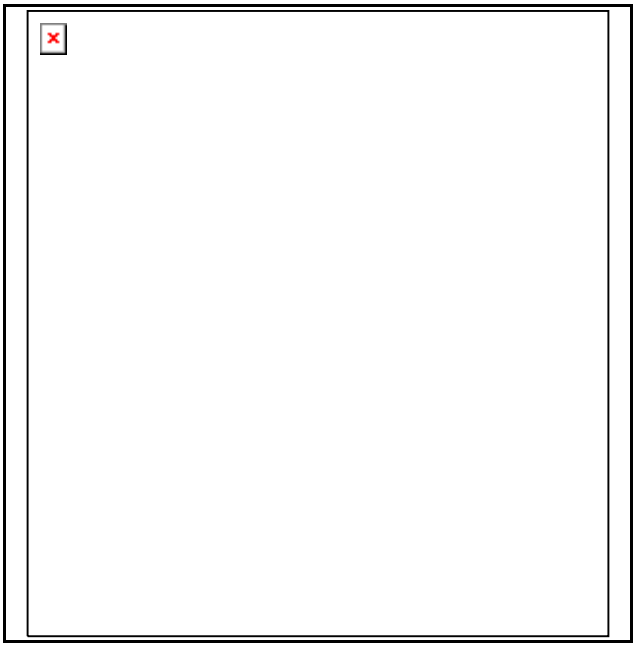
LIGHTS

HEADLIGHTS

Extra-bright Lights

The stock E.R.A. headlight wiring harness is adequate for up to 65W bulbs. 100W bulbs require auxiliary relays to carry the extra current.

All holes for mounting the lights are pre-drilled at the factory. The headlights can only be installed with the correct orientation.

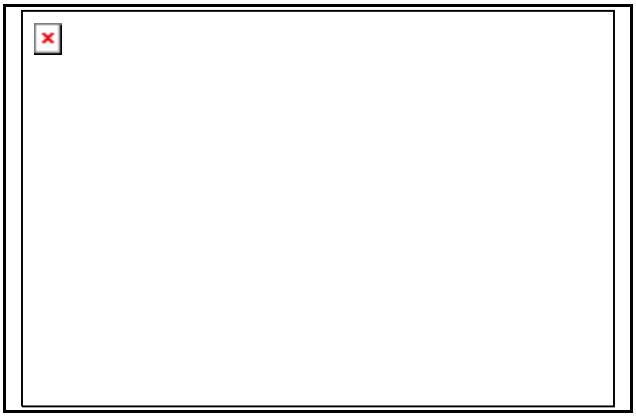


e\flights1

Mount the headlight assembly and gasket with four #10 Phillips pan head tapping screws.

Pass the headlight wires (with the parking light wires) through the rubber grommet in the inner panel and rearward to the top of the spring perches. Connect to the wiring harness and ground as shown in the separate wiring instructions. Leave the rims off till the headlights are adjusted.

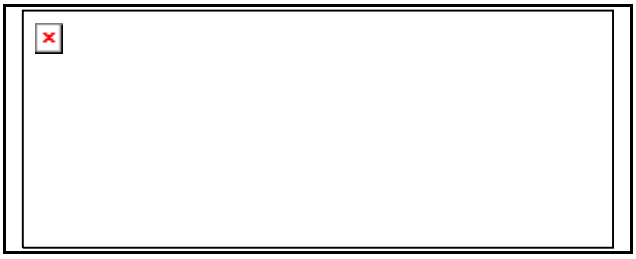
SIGNAL LIGHTS



fiat\man\e\fparkwir

Install the parking light harness along the inside of the inner panel, above the corner of the radiator, securing it with the clamps on the top inner panel.

Connections are as shown in the following illustration. Check the wiring instructions for further notes.



g\flights2

When making the wiring connections and inserting the bulb, use a light electrical grease to prevent corrosion from water and road salts.

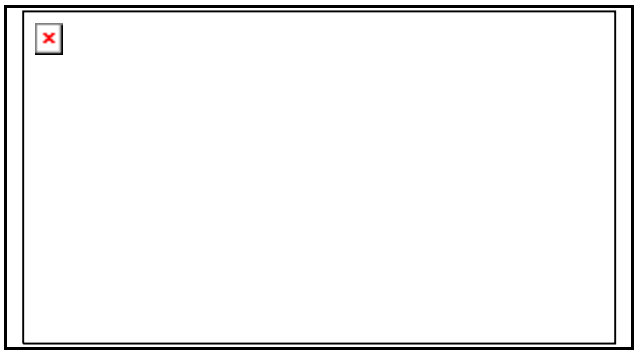
Mount with the supplied #10 stainless nuts and bolts. The lights have male and female terminals which mate with the harness only one way. Connect the black (ground) wire (with the eye terminal) to one of the light mounting bolts.

On some **twist-off lights**, it is possible to insert the bulb two ways. If the the signal light is dimmer than the parking light, remove the bulb, turn it 180° and reinsert it

TAIL-LIGHTS

The lenses of the lights are mounted with the lettering on the lens right side up.

Taillights may have pigtails with female connectors. Otherwise connections are made directly to the small receptacles on the light socket.

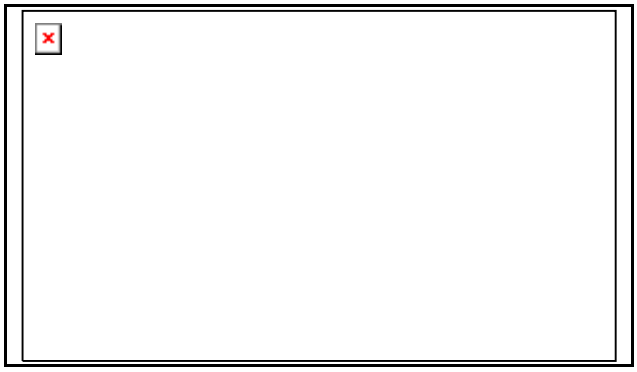


g\tailites

To make the tail light connections:

- Make sure that the rear harness black ground wire is connected to the light stud or ground receptacle.
- With the parking lights on, the red wire should be live. Touch the red wire to each pigtail (or connector loop). Connect that wire to the dimmest filament.
- Connect the other wire to the remaining receptacle at the bulb bottom.

LICENSE PLATE LIGHT



ebod\liclite

INSTALLATION

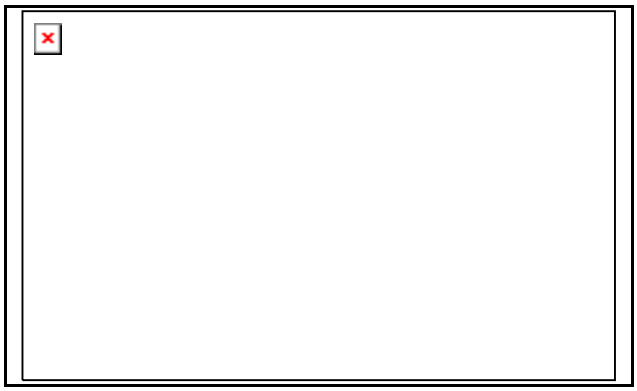
Remove the attachment screw, lens and cover.

Insert the red wire through the larger of the 3 holes in the deck lid and through the back of the light gasket.

Connect the black wire to the case and the red wire to the loop on the bulb holder.

Attach the light to the deck lid and refit the lens and cover.

BACK-UP LIGHT (OPTIONAL)



ebod\bulite

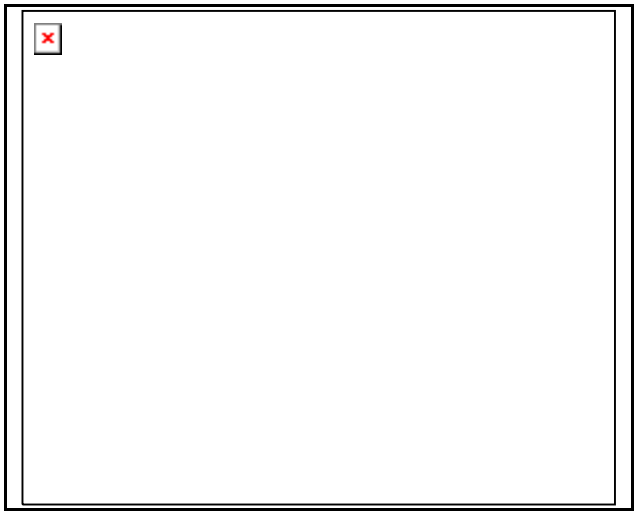
Back-up lights may be required in some states. The type and location of the light is the customer's choice, but we recommend mounting the light on a bumper bracket or the nudge bar. Partial back-up light wiring is built into the harness. The wires for the back-up light switch connections exit the main harness on the passenger compartment side of the firewall.

MIRRORS

DASH

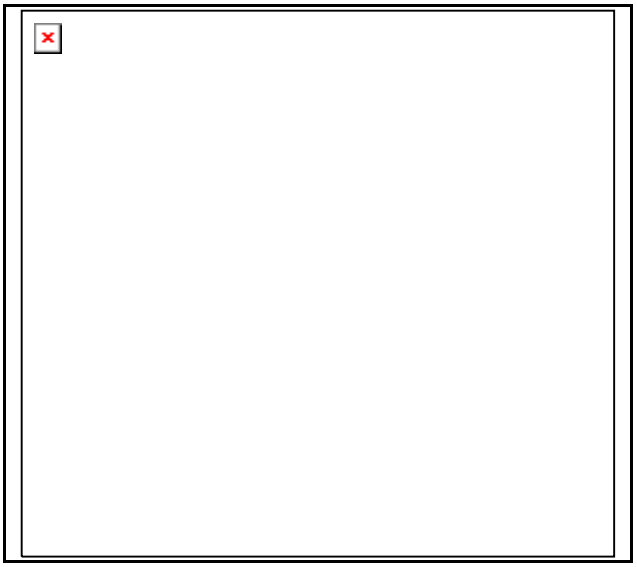
COMPETITION STYLE

Attach the bracket to the dashboard with the included #8 screws. The bottom mirror nut should hang over the edge only minimally. Typically, the mirror is placed just to the left of the center tonneau snap.



g\racemir

STREET STYLE



For the obsessive compulsive: *The backside of the mirror and the clamp on the original cars was black wrinkle-finish paint.*

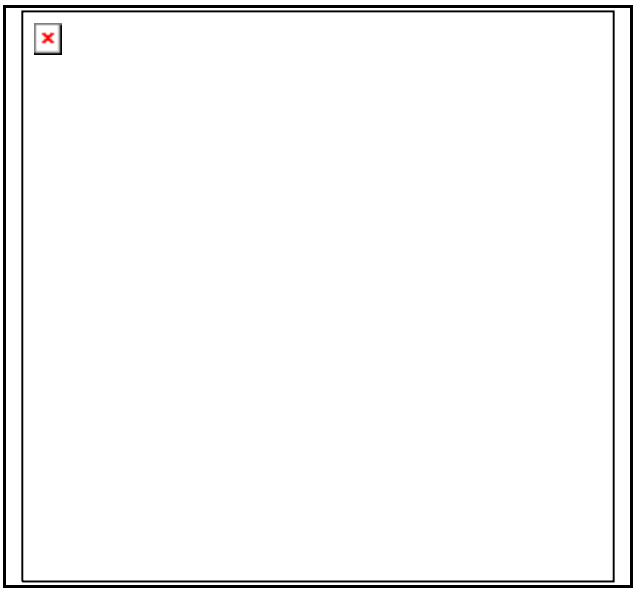
Assemble the mirror as shown. The upper and lower clamps hold the rim against the reflector. Note that the stainless steel reflector is only polished on one side.

Mount the rearview mirror on top of the dash in the pre-drilled holes using chrome #8 oval head Phillips tapping screws. See below for mirror hole locations.

SIDE

COMPETITION STYLE (ON DOOR)

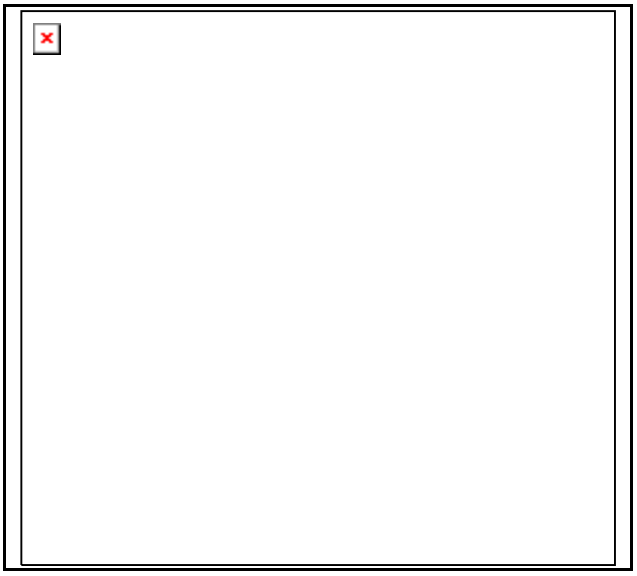
The Raydot-style mirror is attached through the front side curtain ferrule as shown. Drill and safety wire the “long nut” after tightening it only enough to keep the mirror in place but not so much as to crush the body.



G\racemiro

COMPETITION STYLE (ON WINDSHIELD)

The left side mirror is shown below. The right side bracket has a slight bend to tilt the mirror toward the driver.



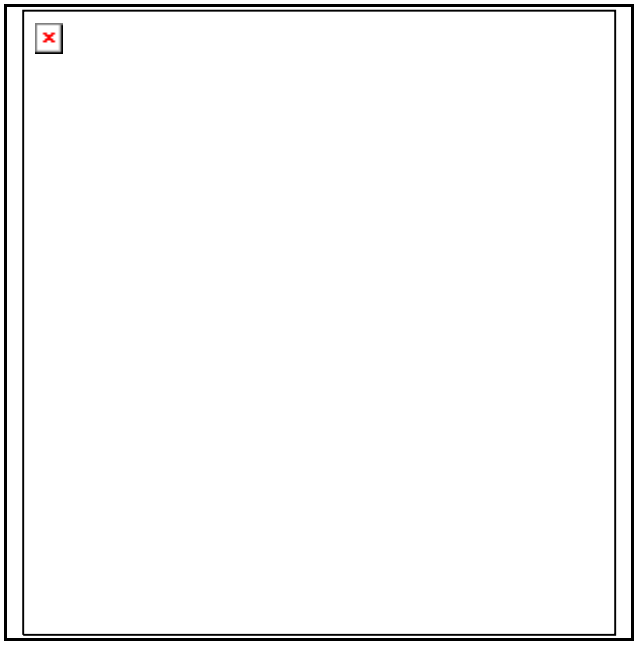
STREET STYLE

Follow the instructions included with the mirrors for disassembly. You *may* have to drill the holes in the base larger to fit the included screws.

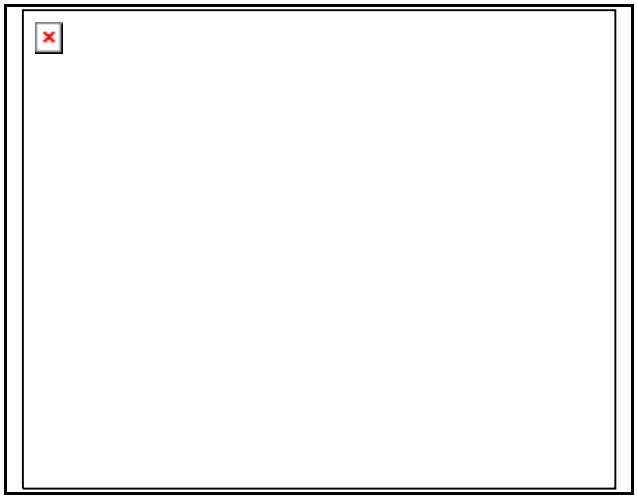
Have a friend help you locate the mirror on the fender. Use wide masking tape to protect the fender where the mirror is to be mounted.

Use the plastic gasket to mark the outline of the gasket and the mounting holes onto the tape. Make sure the gasket is facing in the right direction.

The Street mirror is assembled as shown.



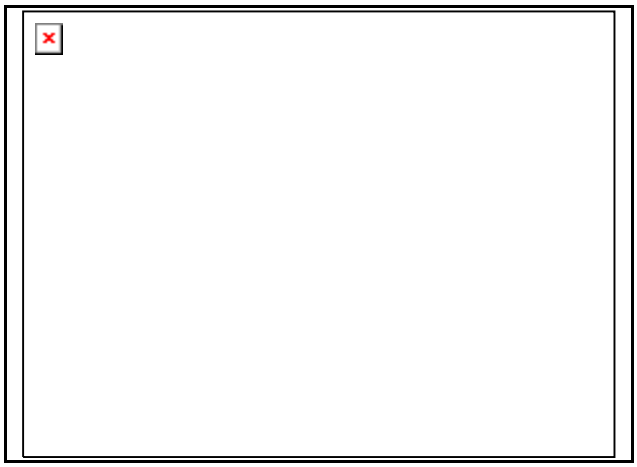
Postioning the mirror (typical).



ebod\outmir1

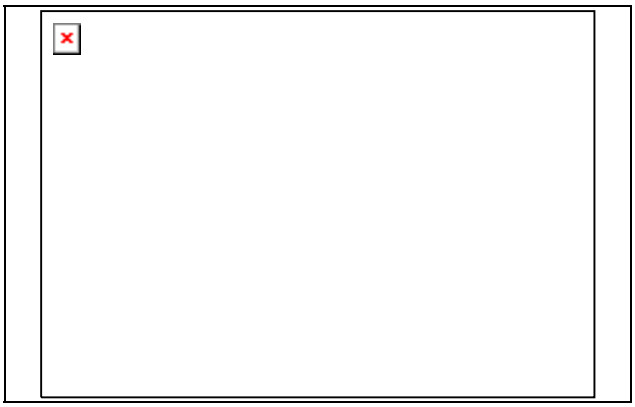
Position mirror pedestal on the fender over the hole markings and within the gasket outline.

Holding the pedestal in position, drill two 1/8" holes where marked, making sure to hold the drill at the proper angle. Be very careful when puting in the screws. If they are too tight in the hole, "adjust" the hole size with the drill. See the illustration on page 116.



ebod\sidemir

GRAB HANDLE



Attach the handle to the dash with chrome finishing screws, #10 x 3/4"L if the dash is 1/2" thick at that point. If the dash is thinner at the attachment points, sometimes we use a 10-24 screw with a nut.

TOP SNAPS

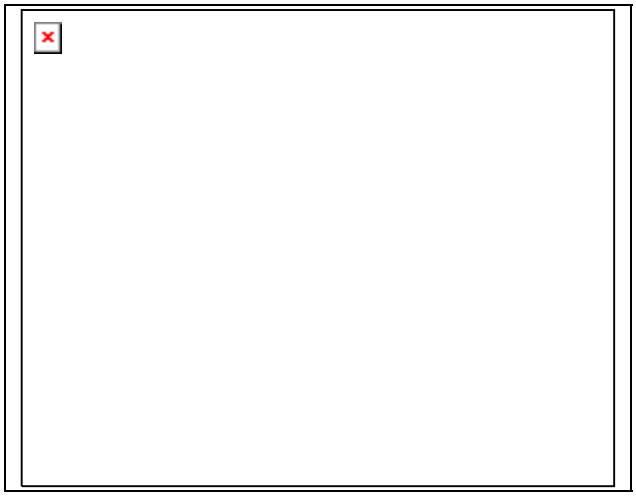
The top snaps were trial fit before paint. If the screw holes have **paint** in them they should be **chased** with a 9/64" drill bit.

Use a fiber or plastic washer under each snap. Do not over-torque! The studs are plated brass and break easily.

DOOR TRIM

STEP MOLDING

Anodized aluminum doorstep moldings come with the *optional street interior* only. They are pre-drilled but must be shaped to the door opening.



Note that the short lip side of the molding is to the inside of the door opening. Carefully pre-shape the molding by hand as closely as possible to match the door opening. Form the molding by starting at the rear edge, lining up the radiused edge as shown below.

Drill a 3/32" hole into the door opening flange through the top hole above the door latch striker.

Attach the molding at the top with one of the screws provided. Enlarge the hole slightly by running the drill in and out if the screw does not go in easily.

Press the molding tightly against the sill and carpet. Drill the next hole and insert the screw (#4 x ½"L countersunk). Continue for the entire length of the molding.

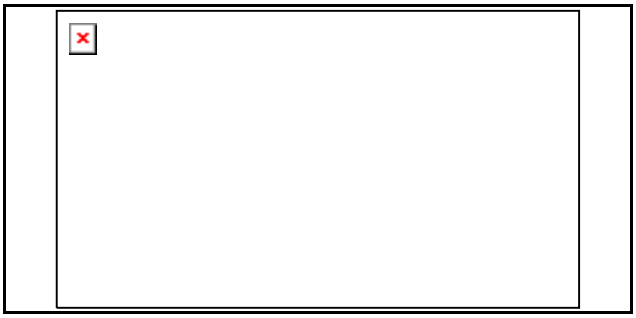
EMBLEMS

The nose and trunk emblems are optional and only "legal" for a street-style car.

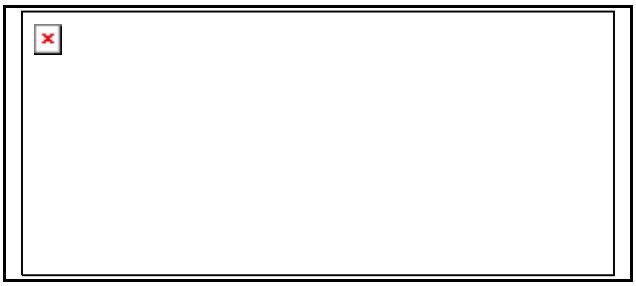
NOSE

Lay out a centerline by projecting the line of the hood forward and measuring across the headlights. Use masking tape to protect the paint during marking and drilling of the hole locations.

Follow the dimensions in the diagram below for the location of the original type "Cobra" emblems. Drill $^{1}/_{8}$" holes for the emblem studs. Access holes are already in the inner panel.



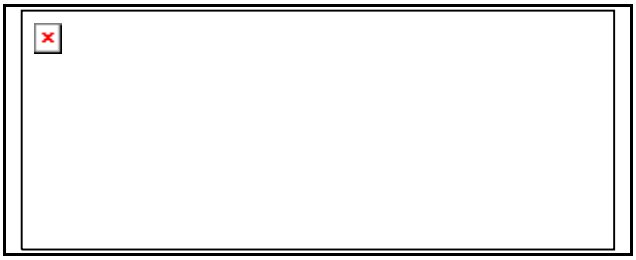
Secure the emblems with the press-on speed-nuts provided. Alternately, some use double-sided tape after removing the pins.



g\emblem1

TRUNK

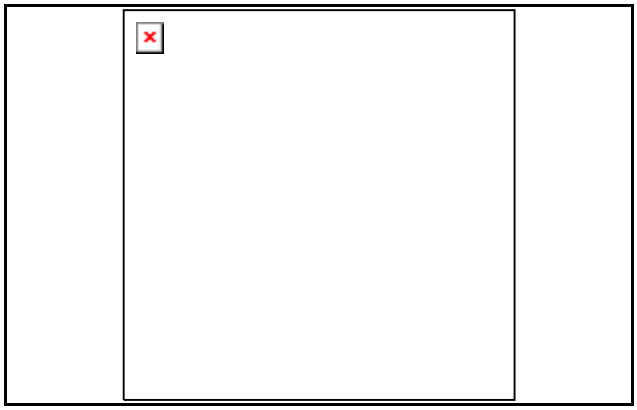
Follow the same procedure as the nose emblem installation.



g\emblem2

SIDE

Project a line directly up from the 4th louver.



g\emble_side

LICENSE PLATE(S)

FRONT

E.R.A. offers a tilting bracket to mount the front plate on the optional front grill surround or a bracket that mounts underneath the left front parking light.

REAR

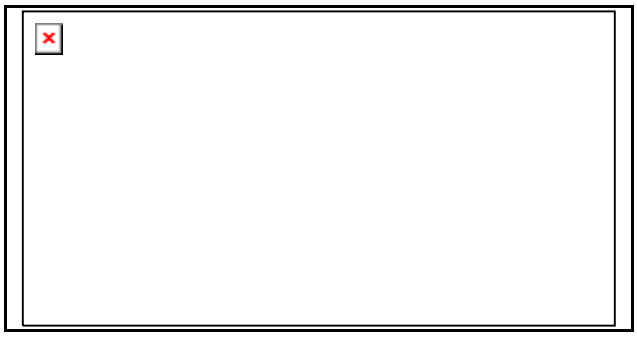
The rear plate may be mounted directly to the trunk lid using $^{3}/_{8}$" (minimum) plastic spacers between the plate and the body. Alternately, E.R.A. offers a plain bracket or a special *Carroll Shelby Motors* frame. See page 113 for installation of the basic bracket.

EXHAUST SYSTEM

PRIMARY PIPES

Install both primary pipe manifolds from the top. Bolt into place with a gasket and high temperature silicone (like Permatex Ultra Copper 81878) exhaust sealer. Once the car has been warmed up, and periodically thereafter, re-torque the primary pipes.

Seal the junction of the primary pipes and the side or collector-to-muffler with silicone or Walker Acousti-seal.



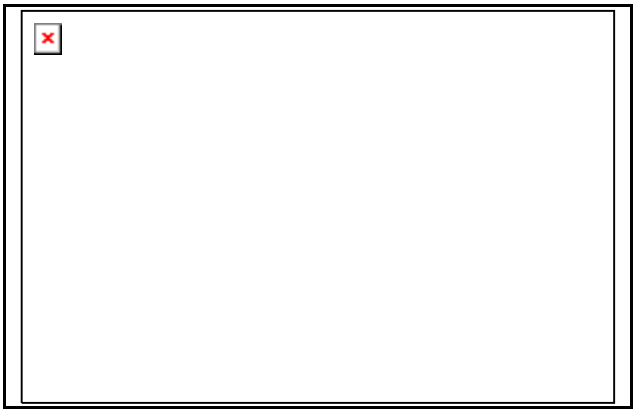
G\primpipe

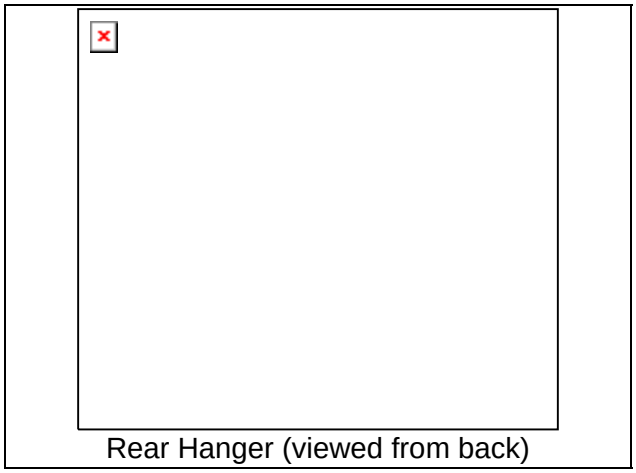
COMPETITION PIPES

The outside pipes are available in bare steel. **After the brackets are welded on**, the bare steel can be painted with a VHT type coating (usually must be re-done every year), ceramic (HPC, Jet-Hot, Airborn Coatings, etc.) or chrome plated.

We recommend that the primary pipe collectors be **ceramic coated**. This decreases the heat radiated in the engine compartment and extends the life of the pipes. Because of the slip fit into the side pipes, mask the last 1 ½" of the outside surface before coating.

The flanges of the primary pipes may have distorted during welding. Use a flat surface to check their condition. If there is more than .020" variance from flat, grind, file or mill the surfaces.





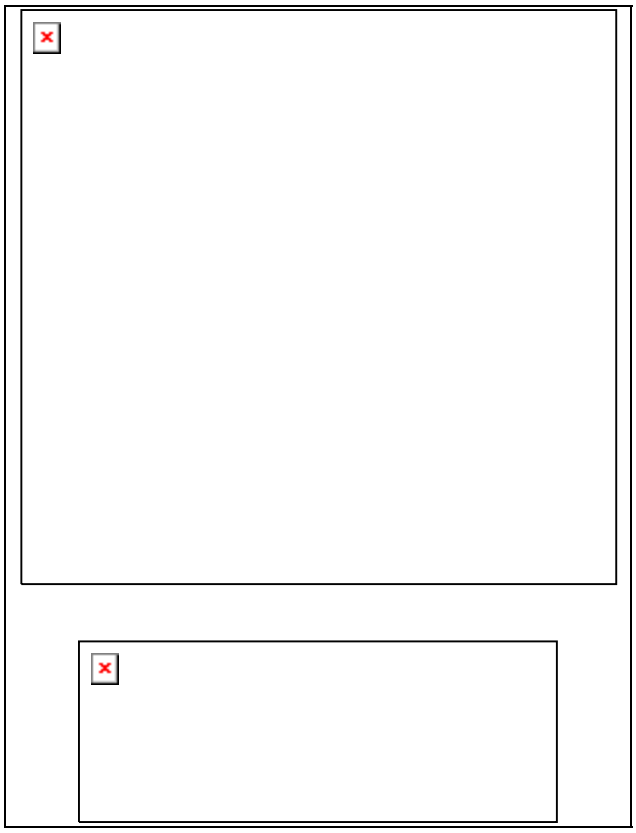
Rear Hanger (viewed from back)

UNDERCAR

Install **insulation** on the underside of both the floors to minimize heat transfer into the passenger compartment:

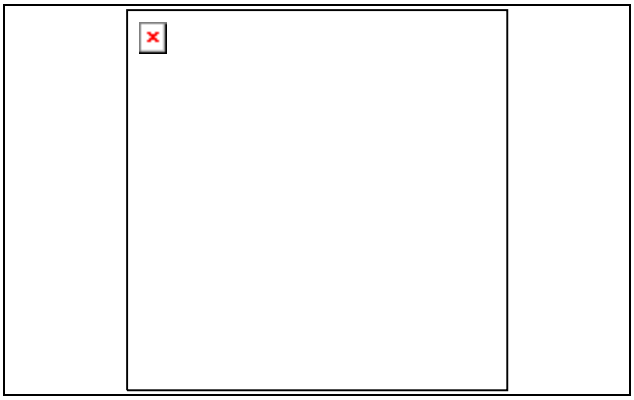
- Glue or rivet 1/8" aluminum or stainless faced insulation onto the bottom of the floors.
- Add jute or foam insulation underneath the rugs.

The exhaust hanger mounting holes are on the floor transverse supports: One in the front support, two in the rear.

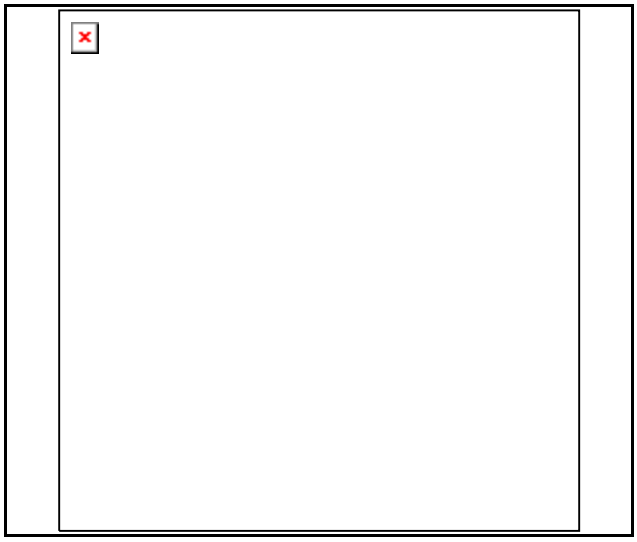


HEAT SHIELDS

The (optional) heat exhaust heat shields help to keep heat off of the footboxes. Assemble the left and right pieces as shown.



Holding each top and vertical assembly in place, mark the aluminum wheelhouse for the upper holes and drill for the #10 screws (9/64"). Attach the upper pieces with screws, then drill through the bottom holes into the footboxes for the #6 screws (#30 drill).



CONVERTIBLE TOP

FITTING THE TOP KIT

More pictures (of a 427) at www.erareplicas.com/427man/top/index.htm

While it is possible for an individual to fit the top, E.R.A. recommends that the top be fit by a professional upholsterer, especially if you have a roll bar. The following general guidelines will be of some help. ERA takes no responsibility for any damage resulting from installation of the top by any party.

To **prevent scratches** in the paint, tape heavy paper over the area of the rear body snap studs. Punch holes so the studs protrude through the paper.

If you have side curtains, match the angle of the windshield to their front edge. See the ***Side curtain*** section below.

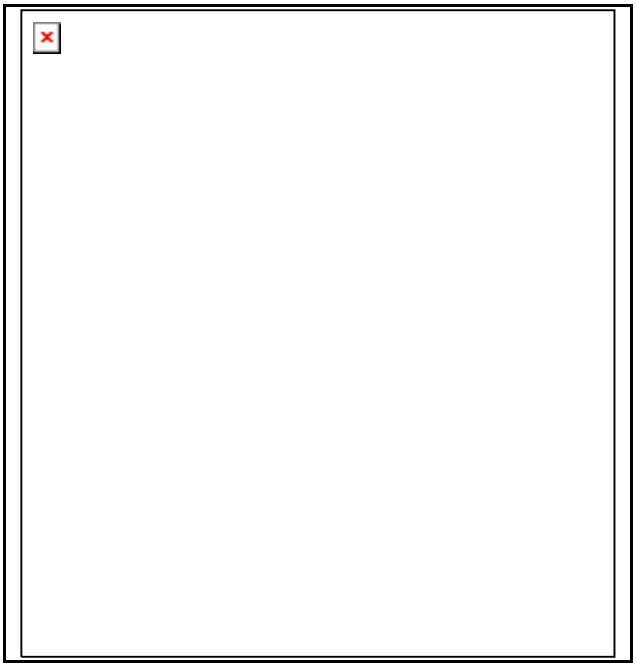
Install the front channels onto the windshield frame. The inside portion of each front channel has a stud which inserts into the slot of the frame. See below. Press down to engage, slide to the outside and down in the windshield frame. Check that the stud is secure in the windshield frame.

Secure the stationary brackets to the windshield side posts with the screws provided - Locktite® recommended on the screw threads.

Assemble the rear bow halves together. Turn the knurled adjusters all the way into the ends of the bows.

Install a ferrule in each of the receptacles adjacent to the body just outside the seat-backs. Slide the bow assembly into the sockets with the hinged brace toward the rear.

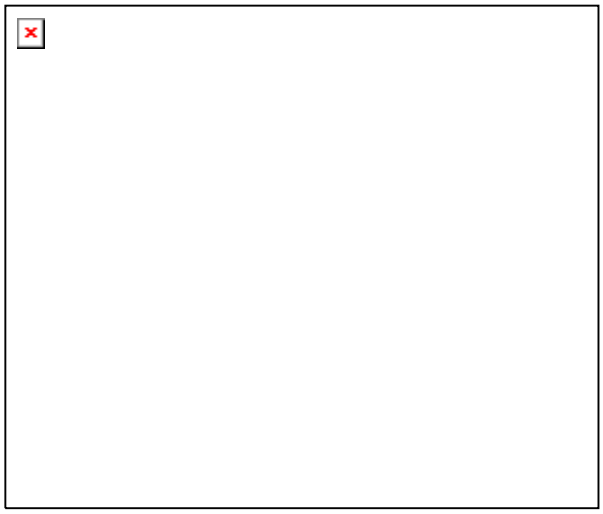
*Do not try to fit a **cold** top! Always work at room temperature or above.*



E\topfit1

Install a **snap** on each rear flap as close as possible to the outside corner:

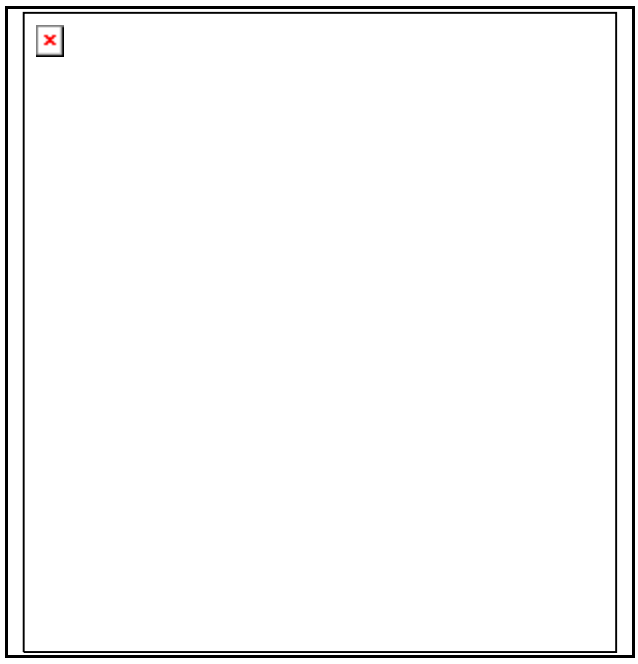
- Punch a center hole in the fabric. Use the snap backing plate as a guide to make 4 small slits in the fabric with a sharp knife.



From the outside, insert the prongs through the small slits. Install the snap backing plate to the underside of the material, bending the prongs to secure the snap.

Lay the top in place over the rear bow and secure the snaps to the studs in the body closest to each rear door opening. If the top is too tight for the snaps to reach the studs even at the lowest height adjustment, remove some material in the where the main bows come together to create some slack.

If the frame doesn't follow the contour of the fabric, it can be "tweaked" to fit by hand/over-the-knee bending.



e\topfit2

Starting on the passenger side of the car, install the balance of the snaps in the center of the flap, alternating from each side towards the center.

If the car has a roll bar, carefully make a slit from the bottom edge of the top to about 1" into the plastic window. A small boot can be made from two pieces of fabric sewn together, sandwiching the top material between them.

Glue felt pads to the underside of all snaps to prevent paint damage..

Use 2" masking tape to tape each front channel down to the top of the windshield securely at the outer edges. Pull the top fabric over the top of the channels, beginning at the center and working over to each side, taping the material to the windshield glass as you work.

Alternately adjust the top over the rear bows and pull and re-tape the top material at the front to remove slack from the top and minimize wrinkling. Do not pull hard at any time. Stress can break the windshield! Make sure the top material is centered on the front bows and windshield. Keep adjusting the fabric at the rear and front of car until the top is smooth and sag free.

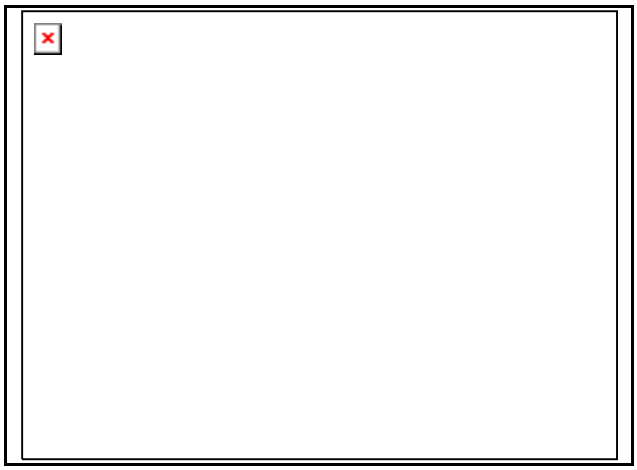
Beginning at the center, carefully un-tape a portion of the top fabric from the windshield. Glue a portion of the top fabric to the front vertical face of the channel with contact cement. **Do not** apply the glue to the top of the front bow, only to the front surface. Work from the center to the sides until the entire top surface is glued.

Remove both front bows and wrap the front of the fabric around inside the channel, leaving a couple of inches hanging at the sides. Trim the excess front fabric and glue the material into the inner surface. See above.

With the top installed, tape down the edges of the front bows securely.

Attach the latch "hooks" to the windshield frame using the hardware provided. See the diagram below. Determine where the latches must be installed on the front channel to provide proper tension on the front channel when installed with foam rubber between the channel and top frame. Mark the holes for the latches on the fabric of the front channel, then remove the channels from the car to drill the holes for the rivets. Rivet the latches to the front channel. Remove the remainder of the mandrel from the rivets, and peen the backside of the rivet as flat as possible.

Glue the extra flap of material on the top over the exposed rivets on the backside of the front channel.



Glue 1/8" thick foam strips to the inside of the front bow channels to seal the top of the windshield frame.

REMOVE AND REPLACE

(after fitting)

***Cold** temperatures make top installation difficult.*

Install the top bows with the hinged frame toward the rear. See above.

Lay the top in position across the top bows. Install the header channels on the windshield by engaging the header tang into the slot in the top of the windshield.

Engage the outside windshield clamps to the header, but don't cinch them down.

Working toward the center from each side, press the lift-a-dot fasteners onto the body studs. It helps to rock the fastener back and forth a bit.

When all lift-a-dots are secure, cinch down the windshield clamps and adjust the height of the bows at the sides.

If the top is too loose, unscrew the knurled ends of the top bows to raise everything.

Remove in the reverse order.

SIDE CURTAINS

If your top has not already been fit, the windshield angle may be matched to fit the front edge of the side curtain. If you intend to install side curtains in the future, E.R.A. can supply a template to determine the angle. Once the windshield angle has been determined, the top may installed to fit.

If the top has been fit, the windshield angle may effect the fit of the side curtain front glazing. The front edge of the curtain may have to be trimmed. See below.

The door must be open wide to install the side curtain mounting pins into the door ferrules. Trial fit each curtain to the door.

If the pins do not match the sockets, it may be necessary to "tweak" the pins and/or elongate the fiberglass holes in the door so that the body ferrules can shift slightly:

If the pins are not parallel to each other, bend them with pliers, etc. *Just because you can start the pin in the ferrule does't mean it won't bind further down.*

If straightening the pins doesn't solve the problem:
Remove the center ferrule after removing the circlip at the bottom. This will make checking fit of the outside pins easier. (The center pin can be fit afterward.)

Use a round file to elongate the holes in the door skin and inner panel to match the front and rear pin locations. Don't make the holes uniformly larger in diameter. Oval them in-line with the other pins, so that the curtain frame will not rock from side to side.

Once the pins fit in the outside ferrules, repeat the process for the center one. Replace the circlips.

Install each side curtain on the door and close the door carefully. If the side tilt of the curtain does not match the side of the windshield frame, carefully bend the curtain in or out as necessary.

Trimming the front edge:

The top corner of the Plexiglas may have to be matched to the windshield frame. Peal the fabric back from the frame as necessary and trim the sides with a hacksaw. (To prevent scratching, mask off the Plexiglas.) Saw the excess material from the top edge of the frame and bend down to match the sides.

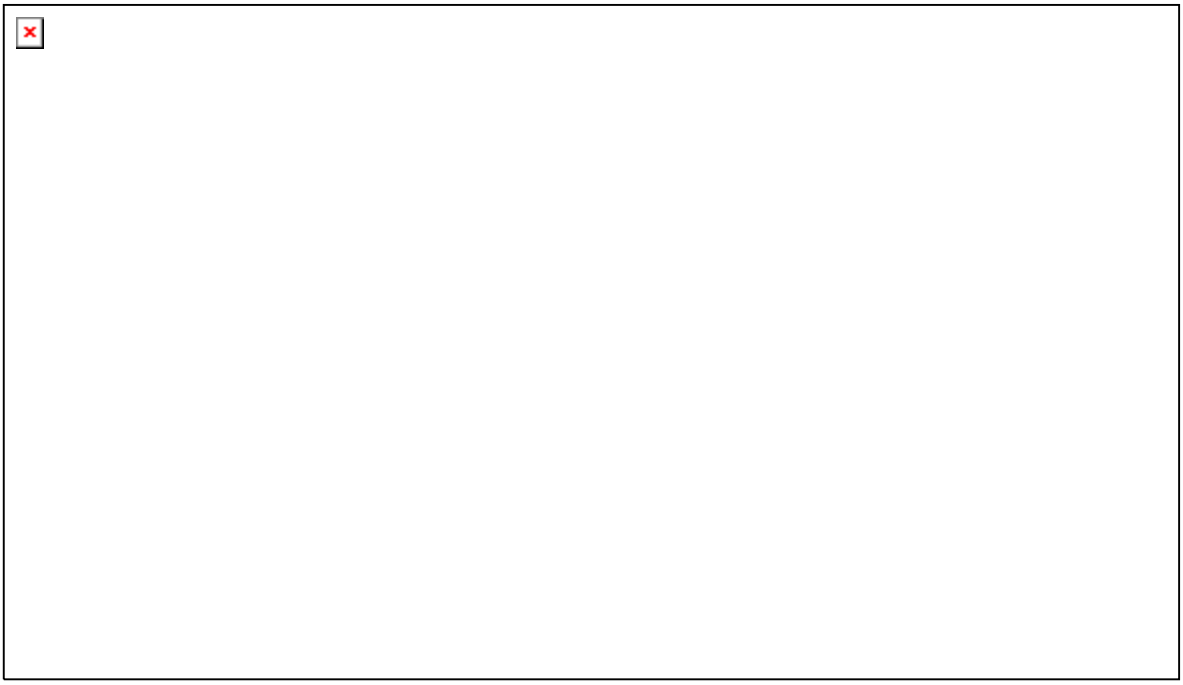
The Plexiglas can be shaped to match with a bandsaw or with careful grinding. Finish with a sanding block and wet 180 or 220 grit paper.

Trim and re-glue the fabric to the frame.

FITTING THE TONNEAU COVER

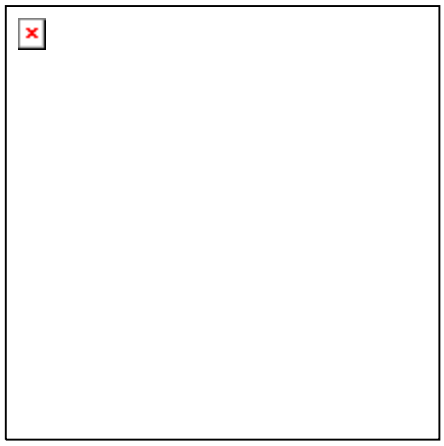
Stretch the cover over the snaps. Mark and install the snaps as described above for the top.

SECTION H
FINAL OPERATIONS



INSTALL WIPER ARMS

Without the arms installed, cycle the motor through high and low speed. When you turn off the switch, check to see that the drive posts return to the far right (passenger's side) position.

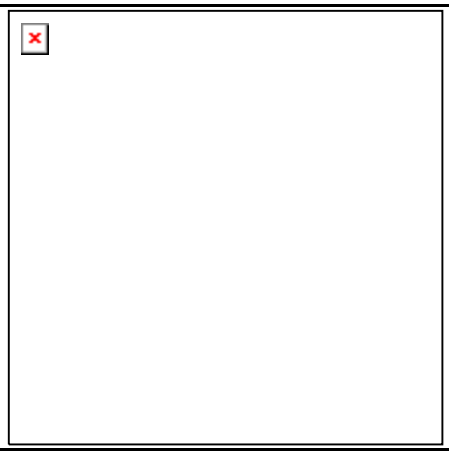


Press the arm onto the post so that the blade falls at the base of the windshield, just above the frame. See above.

Check the sweep of the wiper and adjust if necessary.

Removal:

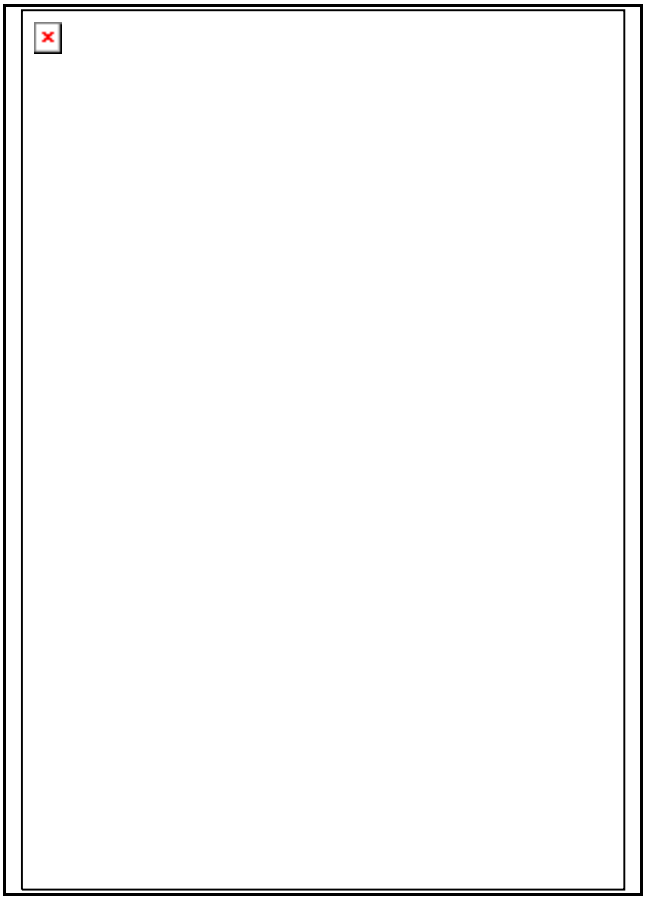
Use a screwdriver to pry between the post base and the edge of the arm, opposite to the blade.



CLUTCH HYDRAULICS

HOSE INSTALLATION

See page 32 for an illustration of the slave cylinder. Ask about oncentric slave cylinder installations



h\clhose

Check the tightness of all fittings before bleeding.

BLEEDING

The car must be level for this operation

Fill the brake/clutch reservoir with DOT 3 or DOT 4 fluid. Silicone fluid is not recommended.

Attach a small hose to the slave cylinder bleeder nipple, emersing the other end of the hose in a small cup of fluid. Loosen the nipple about $^{2}/_{3}$ turn with a $^{9}/_{32}$" or 7 mm wrench.

Work the arm on the clutch pedal shaft (instead of pushing on the clutch pedal itself) until only clear fluid comes out of the hose.

Close the bleeder nipple and pump the clutch pedal several times. If there is more than 1" travel at the pedal before resistance is felt, repeat the bleeding procedure.

ADJUSTMENT

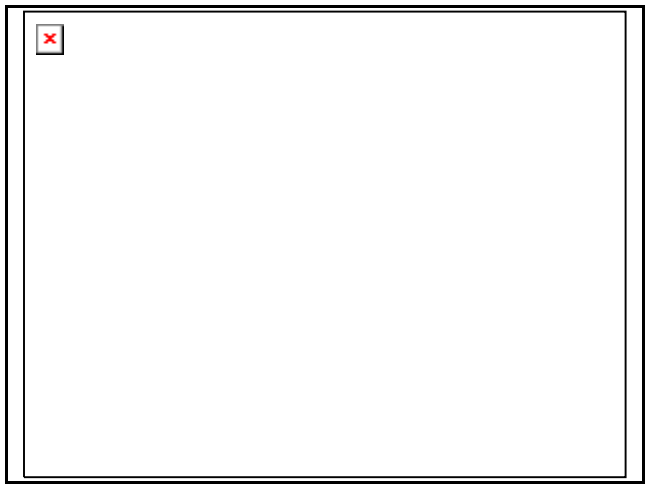
If no return spring is used on the clutch lever, the clutch will be self-adjusting. Most throw-out bearings will operate with the small constant pressure involved. Those that cannot have pressur must use a return spring and be adjusted periodically.

See page 82 for clutch pedal height adjustment.

WITHOUT RETURN SPRING

Increase the length of the throw rod by unscrewing the ball end, forcing the piston in the cylinder to just bottom out. **Note** that the cylinder is spring loaded to the fully extended position.

Decrease the length of the rod so that there is about $^{1}/_{4}$" play when you push the transmission arm forward.



f\cltchadj

WITH SPRING

Remove the spring. Adjust as above, but leave just $^{1}/_{16}$" clearance. This should result in about $^{1}/_{2}$" free play at the pedal. Lack of free play will result in premature throw-out bearing failure or a slipping clutch. The free play must be adjusted about every 3000 miles.

BRAKE HYDRAULICS

BLEEDING

Have the car level or with the rear higher than the front.

- The brake hydraulic system is bled like the clutch except that there is a bleeder (or two) at each wheel. Check the fluid reservoir level periodically. If you run the reservoir and master cylinder dry, you will have to start over.
- Add fluid level to the reservoir if necessary.
- Bleed air consecutively, starting at the right rear and right front, then left rear and left front.
  The optional **Sierra/Wilwood calipers** have a bleeder on both the inside and outside caliper half. Bleed the inside half first, then the outside within the sequence above.
  If you use the hose and jar method, you can bleed the brakes without assistance as long as the end of the hose remains immersed in fluid.

BEDDING IN THE PADS

The pads react positively to a hard initial break-in. Bring the car up to approximately 60 mph, put the transmission in neutral, and bring the car almost to a stop. Do this several times in sucession to heat the pads up. Allow the pads to cool slowly.

PERIODIC FLUSHING

The most compatible fluids are Castrol LMA and ATE type 400. Both are DOT 3 or 4. Don't use DOT 5 - it's silicone-based and may create problems with seals. You will need about a pint of fluid total.

Since the front and rear brakes are separate systems, it doesn't matter which you do first. While you can use a vacuum bleeder, it's not necessary.

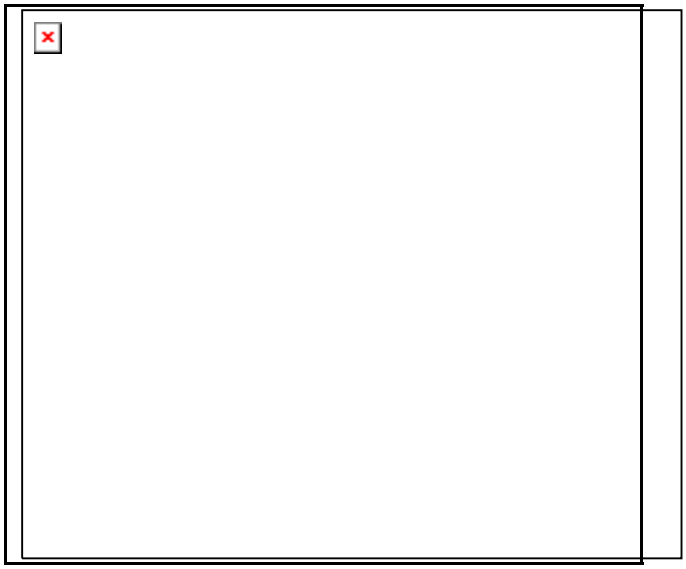
- Open the right front bleeder and pump the brake pedal (slowly) until the reservoir is almost dry or the fluid runs clear. With Sierra/Wilwood calipers, flush the inner half, then the outer. Always leave enough fluid in the reservoir to cover the bottom ports.
- Top off the reservoir.
- Do the same process with the left front caliper.
- Repeat the sequence with the rear calipers, doing the right one first, then the left.

The feed for the clutch is midway up the reservoir. Don't let the level fall below the feed hole when you flush the clutch fluid. Have someone depress the clutch while you open the bleeder. Close the bleeder before they release the pedal. Repeat until the fluid is fresh.

JACKING THE CAR

FRONT

The car can also be jacked up on the lower control arms at the ball joint (be careful not to damage the grease fitting), or the front crossmember as shown. The jack will (barely) fit by going in diagonally just in front of a front wheel, avoiding the oil cooler scoop.



H\fjack

REAR

Jack up by the differential or the crossmember just in front of the differential. The Jaguar suspension can be jacked on the outer end of the control arm or the hub carrier, the ERA suspension, just under the hub carrier.

BOLT-ON WHEEL NOTES

The standard thread of the front (GM) lug nuts is $^{7}/_{16}$"-20. The thread for the rear (Jaguar) are $^{1}/_{2}$"-20. If you have a space-saver spare, be sure to have lug nuts sized for both.

When using the E.R.A. rear suspension, some bolt-on wheels that use a cone-type lug nut will have to be converted to shoulder lug nuts. Call us for details.

PIN DRIVE WHEEL NOTES

Some pin-drive wheel castings have been porous, especially with the real *magnesium* wheels. We recommend that the rim (from bead to bead inside the tire area) be sealed with epoxy paint. Some tire dealers have a special wheel sealant.

Note: The right hand thread wing nut is installed on the left side, left hand thread on the right.

*Use **anti-seize** on the knock-off threads, drive pins and on the wheel mounting surface to prevent long-term seizing of the wheel to the hub.*

When installing the wheel on the hub, make sure the pins line up with the holes. Use a dead-blow or lead hammer (3 lbs) to tighten each wing-nut.

***Tighten** wing nuts in the direction <u>opposite</u> to forward wheel rotation.*

For backup, drill a hole in each wing of the knock-off and use safety wire to secure one wing to a spoke in the wheel (so that it is always being tightened, of course.)

SUSPENSION ADJUSTMENTS

Specifications below are for street driving. Competition settings should be stiffer.

CHASSIS HEIGHT

After setting the springs as described on page 48, the car should be driven to settle everything in. Don't change the spring heights before driving the car at least 50 miles.

COIL-OVER HEIGHT ADJUSTMENT

Front: When you raise both sides of the coil spring collar by X (thereby compressing the spring more), the chassis height will change by roughly 1.5 x X. In other words, to raise the ride height by 1", move the spring collar up by $^{2}/_{3}$".

Rear (with Jag): For small changes, you can adjust only one spring per side. The ride height will change roughly ½ the collar change. For larger changes, change all four of the collar positions equally. The ride height will then change roughly equal to the collar height change.

FRONT SPECIFICATIONS

The specifications for the standard front spring preload are on page 48. This will result in about 7" from the ground to the bottom of the front crossmember (4 $^{3}/_{4}$" to the front of the main rails). Once the height is correct, tighten the front upper control arm pivot bolts. See page 71.

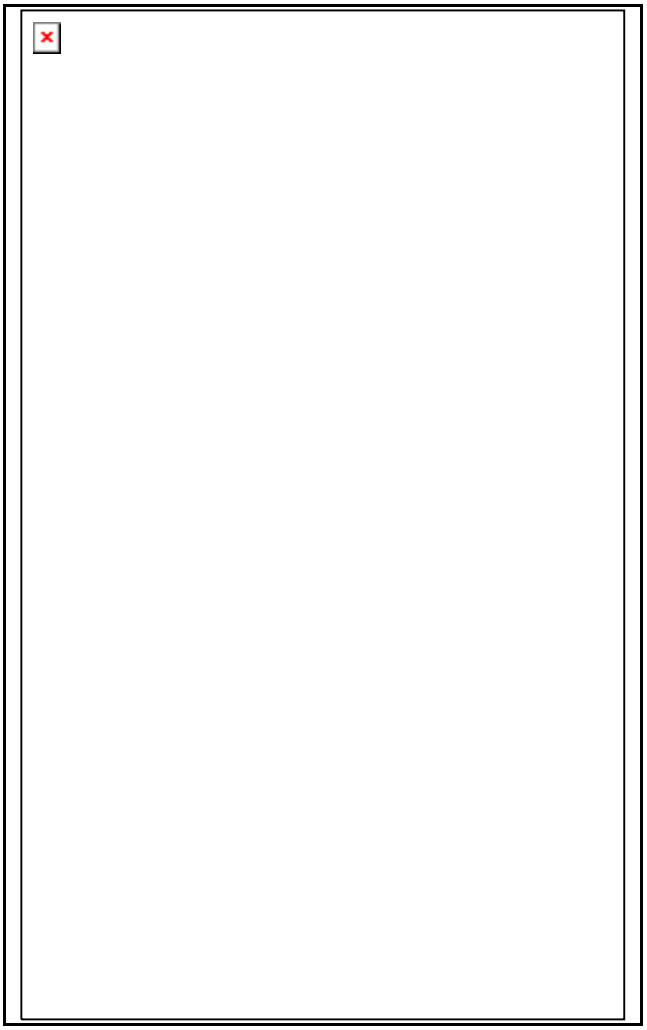
f\ch_hite

REAR SPECIFICATIONS

If you have adjustable spring collar shocks, the rear height can be adjusted to taste. E.R.A. recommends that the main chassis rails be raked about $^{1}/_{4}$" to $^{1}/_{2}$" from front to back.

ALIGNMENT

*See pages 71-75 for suspension assembly. The **chassis height** should be within the specifications given above. Inquire for recommended starting settings for **all-out track work**.*



h\camber

FRONT:

Note! Some automated alignment machines require a specific car to tell the operator how to move shims. The closest production car is the '73-'76 Chevrolet Monte Carlo

Camber 0 deg. +/- 1/4

We've included (12) 1/8" shims with the kit which, when distributed equally usually results in the approximate correct camber.

Adding a 1/8" shim between each bracket and the chassis will increase camber by approximately 1/2 deg. Use standard 1975 Chevrolet Camaro shims or their equivalent.

All ball joints, outer tie-rod ends and wheel bearings are Chevrolet. The upper control arm pivot shaft is an aftermarket part for the same application, but is offset for more camber adjustment. Replacement part numbers are on page 135.

Caster 4 deg. +/- 1/2

- The caster value of the left and right sides of the car should differ by less than 1/2 deg., and the **right caster** should always be equal or greater than the left to compensate for road crown.
- Shifting a 1/8" shim from the front of the bracket to the rear will decrease the caster by about 1 1/4 deg.

Toe-in **1/16"-1/8"**

- Loosen the jam nut on each tie rod. Rotate the inner tie rod inside the rack boot to adjust. Each turn of the tie rod relative to the end will change the toe by about 3/16". With the **ERA steering gear**, equalize the distance between the tie rod center and the end of the inner sleeve.
- Once the toe is correct, remove the steering wheel/hub from the splines and re-install so that is centered. Temporarily install the large washer, wave washer and nut, torquing to 10 lb-ft. Final adjustment of the wheel can be done after the car is test-driven. When the steering wheel orientation is correct, tighten the column hub nut to 25 lb-ft. Install the hub center cap as described on page 105.

REAR

Jaguar w/inboard brakes

Camber **-¾ deg. +/- ¼**

Toe-in 0.00” to 1/16" (0 to ¼ deg) toe-in per side

Adjust **Camber** by adding or removing shims from between the brake rotor and the inner drive-axle flange. A 0.02” shim will change camber by ¼ degrees. Most setups will require only one shim, less than is normally used in the original car so you will have extra ones left over. New shims are available from us or your local Jaguar dealer or one of the Jaguar specialists listed on page 26.

The rear wheel toe-in is not individually adjustable. If the toe is out of range, the lower control arms must be bent or replaced. Tracking (longitudinal alignment of the front and rear suspensions) may be changed by adjusting the length of the trailing arms at the rod end to shift the assembly in the chassis.

E.R.A. w/ outboard brakes

Camber: -¾ deg. +/- ¼ deg.

Toe-in: 0-1/16" (0-¼ deg.)

Procedure:

Set the trailing arm lengths as described on page 77.

Set the height as described on page 127.

- Use the rear tie rod to bring the toe-in into spec, but don’t tighten the jam nuts. The threads on the outer section of the tie rod are right hand, the threads into the inner rod end are left hand – so turning the adjuster forward at the top will decrease toe-in. For each complete turn of the tie rod, toe will change by 0.2” (.75 deg.). Turning the tie-rod 1/6 of a turn (one flat on the adjuster) will change the toe-in by 1/32” (1/8 deg.).
- Measure the camber.
- To change the camber, the front rod end must be disengaged from the inner bracket. Jack the car up to unload the suspension and remove the inner pivot bolt. For each ¼ degree of camber change needed, turn the rod end ½ turn in or out. Re-insert the inner pivot bolt and tighten to 75 lbft. Change the length of the rear tie rod the same amount by turning in or out ½ the number of turns that the rod end was changed by: i.e. you rotated the rod end by ½ turn, rotate the tie-rod by ¼ turn.
  To much positive camber can be changed by adding shims between the axle flange and spacer. A 0.02” shim will change camber by ¼ degrees.

DAMPER ADJUSTMENT

SPAX

Spax dampers do not have separate bump and rebound controls, but a reasonable performance compromise can be made using common sense and a screwdriver. The bump/rebound ratio is designed for the ERA 289FIA and only detail changes need be made for optimum handling. We have found that all dampers adjusted 5 clicks from dead soft (see below) is reasonable for the street. Damping adjustment is located near the bottom of each unit at the slotted pin. Rotate the adjustment counter-clockwise until you can no longer feel the adjustment "clicks." This is "dead soft." If you wish to experiment with your own settings, read the instructions below.

Custom Settings: Initially set all six dampers 2 clockwise clicks from dead soft. Drive the car over uneven surfaces to determine whether the car bounces over bumps or wheel control is properly maintained. Increase the damping until side hopping begins, then decrease the setting until control is regained. Read the instructions below for Koni rebound damping adjustments for transition understeer/oversteer adjustment.

KONI (RACING EXTERNALLY ADJUSTABLE)

Bump control: The control knob is located at the bottom of the damper. Turning the wheel clockwise increases the bump control damping. Set all four dampers on minimum bump and rebound settings. Drive to get the feel of the car over uneven surfaces. Observe the behavior over bumps, disregarding body roll. Notice if the car walks or side-hops in a rough turn. Increase bump adjustment 3 clicks on all four dampers.

Drive the car again over uneven surfaces. Increase the adjustments until the car starts to feel hard over bumps. Back off the adjustment 2 clicks. The back off point will probably be reached sooner on one end of the vehicle than the other. If this occurs, keep increasing the bump adjustment on the soft end until it, too, feels hard. Then back it off. Final adjustment can be made after you get used to the feel of the car.

Rebound control: The adjustment is made by inserting a pin in the wheel at the top of the damper. Turning the toothed control wheel from left to right will increase the rebound damping. With rebound control set on full soft and the bump control set from your testing, drive the car, paying attention to how the car rolls when entering a turn. Increase the rebound damping three sweeps on all four dampers and test drive the car. Continue increasing the damper setting until the car enters the turns smoothly, with no drastic attitude changes, and without leaning excessively. Any increase beyond this point is unnecessary and may in fact be detrimental.

Final adjustments can be made to effect the "turn-in" of the car - that is, whether the car has initial understeer or oversteer. By increasing the rebound control at one end it will decrease the initial adhesion at that end. Conversely, decreasing the rebound control increases the initial adhesion. In general, neutral or slight initial understeer is most desirable. There should not be a large difference between transient and final balance, although slightly less initial understeer will increase responsiveness.

TIRE PRESSURES

Use initial settings(cold) of 24psi front, 26psi rear. Depending upon tire brand and size, these pressures will be a reasonable compromise between ride and responsiveness. Remember, this a light car with large tires. High tire pressures are not necessary or desirable except for high speed/competition. Harshness and vibration become a serious factor at higher pressures. If you are using 17" wheels with very low profile tires check the manufacturer's recommendations.

Steady state under/oversteer may be adjusted significantly by working with the tire pressures. If your balance is incorrect, raise the pressures on the axle your want to stick better by about 2 psi and road test the car. You may, alternately, reduce the pressures on the opposite axle for a better ride. Generally, it is the difference in front and rear tire pressure that determines handling balance. If the car does not behave the same cornering right and left, check that the anti-sway bar links are not preloaded, and that the spring preload is equal from side to side.

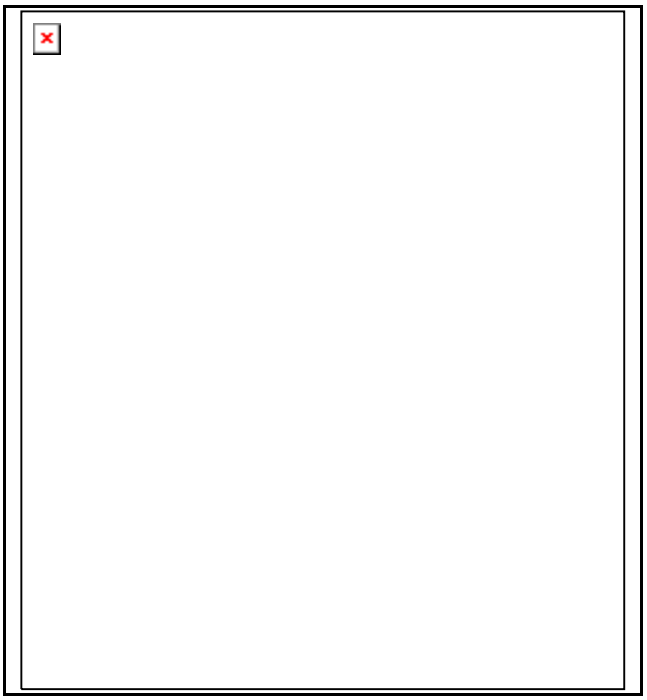
BRAKE BALANCE ADJUSTMENT

Do not change *the brake bias until after the brakes have been thoroughly bedded in. The factory set bias will be fine for most applications. Changes may be necessary because of unusual pad material and/or different calipers. All our standard and optional brakes are roughly compatible with the standard brake bias setting.*

First, ***check*** *that your* ***link length*** *is correct.* *See page 60.*

Generally, on a road with good traction, **the front brakes should lock slightly before the rears**.

Front-to-rear bias is adjusted by changing the spacers on either side of the balance bar bearing. Custom spacers are available from E.R.A. Retain the **total** number of the spacers, shifting them from one side of the balance bar to the other. Standard spacing on either side of the balance bearing is equal. If you have special calipers and require more change than is available at the balance bar, new master cylinders are available in diameters from $^{5}/_{8}$" to 1".



f\brkbal

ADD FLUIDS

Top up the proper oils or fluids to the engine, transmission, rear end, cooling system, and braking system

Engine oil: If the engine has never been run, add oil to the filter and oil cooler before starting. Build up oil pressure by cranking the engine over with the spark plugs removed. Alternately, you may use a drill on an extra long distributor drive shaft to turn the oil pump. Once the pressure is up, you may need to add more oil.

See page 137 for Capacities.

COOLING SYSTEM

SETUP

See page 138 for your optimum proportion of antifreeze.

With a 15 psi pressure cap, the boiling point of water or water/antifreeze mixture will be raised to about 240°F.

In some installations, air may be trapped in the intake manifold or cylinder heads. ***To remove the trapped air:***

- **Open** the bleeder at the upper right of the radiator. **Fill** the system with the cooling mixture. Once water flows bubble free from the radiator bleeder, shut the valve. (Actually, we usually fill the system with water first and pressure test for leaks, then drain half the water out.)
- With the expansion tank full, **loosen** the water temperature fitting on the intake manifold. Air will be expelled. When nothing comes out but fluid, tighten the fitting.
- **Repeat** the bleeding process after the car is run. More air will usually come out.
- Check the hoses and **retighten** all the hose clamps.

HEATER:

With the system pressurized, loosen the higher heater hose at the heater fitting to remove any air.

OVERHEATING:

Also see the web supplement information at http://www.erareplicas.com/fiaman/index.htm

Use a 165℉ -180℉ thermostat for street use. Leaving the thermostat out will cause overheating. Remember that the boiling point of a water/anti-freeze mixture with a 15 psi cap is ***over 230℉****. It is not harmful (and normal) for the water temperature to rise to 210℉ - 220℉ with the car not moving.*

AT SPEED

The E.R.A. 289FIA uses an oversized radiator. Overheating at speed is almost always the result of mechanical failure of the water pump or incorrect engine settings, usually retarded ignition timing. Check your dynamic timing at idle and 3000-3500rpm, or as recommended by your engine builder. If you are using significant lengths of hose in the connection from the radiator to the water pump intake, make sure that the hose has an internal spring to prevent its collapsing.

Small block Fords were also available with water pumps that work in either forward or reverse rotation directions. Make sure that your pump is designed to rotate in the correct direction!

Water pumps have been known to fail invisibly. The impeller comes loose from the shaft under load.

Sometimes an extremely tight engine can cause overheating.

LOW SPEED

See the **AT SPEED** section above

Our standard fan is adequate for practically any small block engine under normal conditions – it's the same one we use with the 427SC kit. If you expect high temperature city driving, or you have a large displacement and/or highly tweaked engine, consider ordering our heavy-duty fan.

The fan only effects water temperature when the car is ***below 15mph****.*

TESTING

Fan function:

The fan thermo-switch is in the aluminum connector between the radiator and water pump. Because the sensor is in the coolant return line, the 75° C switch marking will not correspond to the cylinder head temperature that the gage indicates because of the cooling that occurs in the radiator.

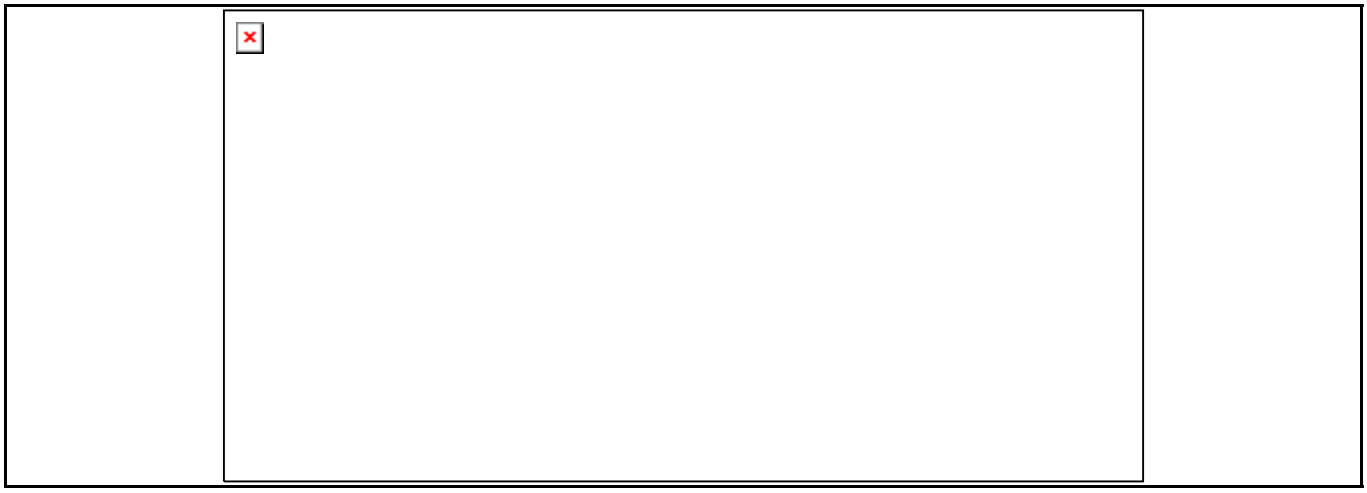
After starting and running the car up to operating temperature (180°F min.), use the dash (manual over-ride) switch to manually turn the radiator fan on. The temperature should stabilize somewhat under 210°F, depending on your ambient temperature. Shut the over-ride switch off and allow the fan to come on automatically. This should happen about 200°F -210°F. If the fan does not start, even at 220°F, check the electrical circuits involved.

Once the temperature drops, the fan will automatically cycle off. ***The fan will run*** *even with the ignition off*, but will normally stop within 5 minutes. This feature helps prevent "hot soak" fuel percolation in the carburetor.

HEADLIGHT ADJUSTMENT

Most service stations have a standard set of headlight adjusters. If you have a flat area (at least 40 ft long) you can do the job yourself.

- Remove the screw at the bottom of the trim ring, and pry off the ring with a flat screwdriver.
- Change the vertical/horizontal orientation with the adjusting screws at the top and side of the headlight retaining ring. See the diagram below.
- Replace the trim ring and screw.



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FINAL CHECKS

Make sure the head, stop, parking and signal lights are working.

Check the horn and wipers.

Check tire pressures.

Check for exhaust leaks.

Re-torque the exhaust manifold bolts.

Check the hand brake. This disk brake system may require more effort than your "other" car.

***CONGRATULATIONS*!** You have just assembled a complete automobile from the ground up! Your E.R.A. will give you the exhilaration and uniqueness of an outstanding, high performance automobile. Enjoy!

See page 139 for hints on inspection, insurance and registration.

YOUR FIRST DRIVE

The E.R.A. 427 is an amazing sports car, but it requires caution and care to drive, especially in the beginning when you're not accustomed to the power. The Loud Pedal is your friend and your enemy! If you add throttle, the car will react as you would expect: with more or less wheelspin. Where people get in trouble is with trailing throttle. If you back off too quickly in a corner (or if the car is already sideways from over-throttle), the rear end will snap around as much as with excess throttle! Squeeze on, squeeze off! A good driving reference is at this site: http://www.drivingfast.net/

So – Be Careful Out There, But Always Have Fun!

RECOMMENDED SERVICE

Fluids and capacities are listed on page 131.

EVERY GASOLINE FILL-UP:

Check engine oil and water

FIRST 1000 MILES

Check the tightness on all chassis bolts.

EVERY 3000 MILES

Change engine oil and filter

Check engine drive belts for wear and tension

Adjust clutch play (if using a return spring)

EVERY 6000 MILES

Inspect front brakes

EVERY 12,000 MILES

Check transmission oil

Grease rear axle and driveshaft universal joints

Grease the inner and outer pivots on the rear lower control arm

Grease front upper and lower ball joints and outer tie rod ends

Check rear brakes

EVERY 24 MONTHS OR 2 YEARS

Change antifreeze

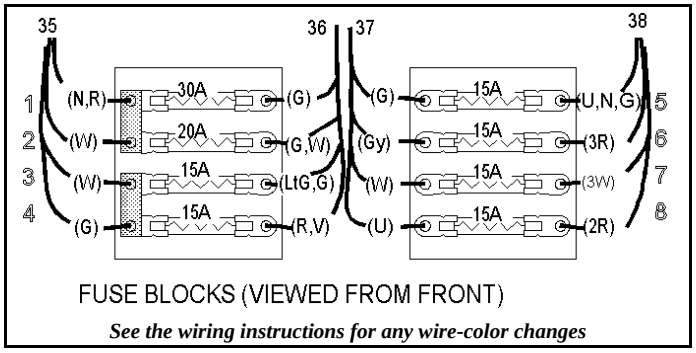
EVERY 24 MONTHS OR 2 YEARS

Change brake fluid. See page

FUSES

1. Radiator fan, heater
2. Horns, lighter
3. Wipers
4. Voltage regulator, Fan relay, Signal lights
5. Brake, backup lights, Fuel pump
6. Parking, panel lights
7. Headlights, high beams
8. Headlights, low beams

There are also two fast-blow 4A fuses under the steering column that protect the rear signal/brake lights individually.



FUSE BLOCKS (VIEWED FROM FRONT)

See the wiring instructions for any wire-color changes

REFERENCE

MAINTENANCE PARTS

All pieces listed below are included in the kit but are listed here for reference and long term replacement.

Part numbers listed are typical, but equivalent brands may be substituted unless otherwise stated. Fluids and capacities are listed on page 131.

FUEL SYSTEM

Filler cap	Parts Master 46139
Filter, In-line	3/8" both ends.

BRAKES

All pieces listed below are included in the kit but are listed here for reference and long term replacement.

FRONT	**Rotor**	**Pads**	**Rotor thickness, max/min**
GM caliper	1975 Camaro	Bendix D52S	1.040"-0.970"
Wilwood caliper (XL)	Wilwood 120-11136 (Left and right)	(Fits Wilwood (Superlite, 0.8" thick pad.) 150-8854K	1.250"-1.190"
REAR			
Jaguar	(1980 XJ-6)	Lucas-Girling GP97	0.500"-0.470"
ERA Rear	'93-'97 GM "F body"	Bendix MKD750, MRD750, PMD750	0.810"-0.770"

HYDRAULICS

Brake master cylinder front	Tilton 74-875U
rear	Tilton 74-750U
Line, Flex front	EIS SP5753 (mod'fd)
rear	EIS SP1358 or Bendix 88264
Bearing, shaft /clutch pedal:	Tor. B1416
Thrust washer	Tor. TRA1423
Bearing, balance bar	Heim LSS-8
Clutch master cylinder ($^3/_4$" or $^7/_8$")	Tilton 74-750 or Tilton 74-875
Clutch slave cylinder (20.5mm/.81")	(72-76 2002) BMW 21521104269

SUSPENSION, FRONT:

The upper and lower ball joints are from: 73-88 Chevelle, 70-96 Camaro and 77-85 Impala.

Ball joint, lower:	Moog 6145, Rep. 10277
Ball joint, upper:	Moog 5208, Rep. 10268
Bushing, lower, inner pivot	Energy Suspenson 9072G or from ERA
Upper control arm shaft assembly, ***w/bushes***	MOOG K6148
Bushings only	MOOG K6108
Shafts and bushes are from 1970-73 Chevy Camaro	
Tie rod end, outer: *Fits Chevy Vega, 1972-1979.*	Republic ES 425R Moog ES425RL
Tie rod end, inner:	E.R.A. part
Sway bar, link:	Republic SL18060
Bushing and bracket	Suspension Techniques PB-93
Bearing, F hub inner	A-2 Bower/BCA
outer	A-6 Bower/BCA
Seal, inner, F hub	National 8871
Steering gear	Flaming River FR1502 3X3
Boot for Mustang based gear	Flaming River FR1502B

TRAILING ARM, REAR

(Front) Bushing/sleeve set	Energy Suspension 9-9105GX

SUSPENSION, REAR, JAGUAR:

Inner pivot bearing, lower wishbone	Tor. B146
Outer fulcrum bearing, lower wishbone	Timken 03062/03162
Seal, inner fulcrum	Jaguar C17168
Seal, outer fulcrum	National 471652
Bearing, inner hub	Timken 18620/18690
Bearing, outer hub	Timken 18520/18590
Hub seal, inner	Beck Arnley 052-0221
Hub seal, outer	Beck Arnley 052-0643 (large)
Sway bar link	Republic SL18050
clamp and bushing	Suspension Techniques PA-75
Universal joint	Spicer 5-160X
Subframe pivot bush	Moog K8169 or Republic 12292
Pinion seal (most)	Jag. AAU3381A

SUSPENSION, REAR, OUTBOARD BRAKES

Outer fulcrum bearing, lower wishbone	Timken 03062/03162
Upper trailing arm, Frnt	HMR-8
Rear	HML-8
Upper radius rod, inner	HMR-8
Upper rad. rod, outer	HML-8
Lower rad. rod, Rr in'r	HFR-8
Lower rad. rods, out'r	Energy Susp. 9-9105
Lower rad. rod, F in'r	HMR-8
Lower trailing arm, F	Energy Susp. 9-9105
Lower trailing arm, Rr	HMR-8
Subframe, top mt.	Same as Jaguar ⇑
Subframe, bottom mt.	Energy Susp. 9-9107
BEARINGS/SEALS	**All from 1976 Jag XJ**
Bearing, inner hub	Timken 18520/18590
Bearing, outer hub	Timken 18620/18690
Hub seal, inner	Beck Arnley 052-0221
Hub seal, outer	Beck Arnley 052-0643
Sway bar link	Republic SL18050
clamp and bushing	Suspension Techniques PA-75
Universal joint	Spicer 5-160X
Subframe pivot bush	Republic 12292
Pinion seal (most)	AAU3381A

STEERING COLUMN:

Bushing, early column housing (with rubber insulators)	Lucas 209423 (Triumph Spitfire)
Bushing, late column	Nylon bush, 1"OD x $^{3}/_{4}$"ID x 1"L (McMaster Carr 6389K226)
Joint, universal	Borgeson U15N $^{9}/_{16}$"x $^{/}/_{16}$" (part of E.R.A. assembly)

MISC./ELECTRICAL

Door hinge bushing	Boston FB58-5

Gages

Speedometer	Stewart Warner D550 BP
Tachometer	Stewart Warner 82170
Oil pressure	???S.W. 82323
Oil temperature	S.W. 82327-60
Water temperature	S.W. 82326-60
Ammeter	S.W. 82311
Fuel level	S.W. 82303

SENDERS/RELAYS-SWITCHES

Standard fuel tank Foam filled tank	SW F-385-B (≅300Ω) Centroid CFG $10^{1}/_{4}$-12V
Relay (Horn and radiator fan)	Bosch/Tyco V23234-A001-X032 or VW 321 919 505
Switch, fan thermo	VW 823 959 431/75
Relay (tail-light)	Standard Ign. TC-52
Switch, brake light	Ford 100810B, GM 403936, Wagner FC5106

BULBS

Headlight	6014
Frt signal/parking light	1157
Rr signal/parking light	1157
Instrument lighting	Smith: GE, Osram 159 S/W short socket: 1893 S/W long socket: 57
Warning lights	Osram 3898**,** Wagner 11009 (BA7S base, 12V, 2W). Used on Honda, VW
License plate (2 rqd)	57

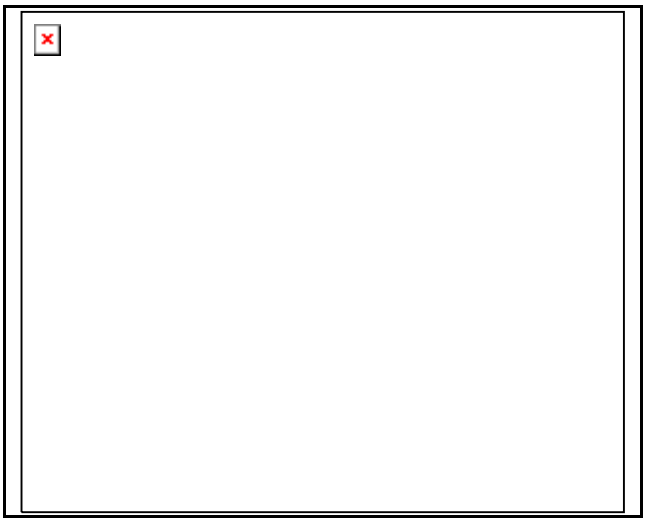
STEERING COLUMN RELAYS, FLASHERS, ETC.

E.R.A. Column Signal/Dimmer Switch	VW #141 953 517F
Dimmer relay	VW 111 935 227 D/H
Flasher (E.R.A., Triumph)	Buss 180

JACKING

FRONT

The car can also be jacked up on the lower control arms at the ball joint (be careful not to damage the grease fitting), or the front crossmember as shown. The jack will (barely) fit by going in diagonally just in front of a front wheel, avoiding the oil cooler scoop.



H\fjack

REAR

Jack up by the differential or the crossmember just in front of the differential. The Jaguar suspension can be jacked on the outer end of the control arm or the hub carrier, the ERA suspension, just under the hub carrier.

CAPACITIES/LUBRICANTS

Brakes: Use DOT 3, DOT 4 or DOT 5.1 fluid for both the brake and clutch systems. We use ATE 200, ATE Blue or Castrol LMA in our rollers. Silicone-based fluid is not recommended.

Cooling system capacity:

3.5-4 gallons

For optimum cooling, it's best to use the smallest proportion of aluminum-compatible anti-freeze commensurate with your local temperatures. Pure water has the best heat transfer rate of all. We've had good results by adding **Red Line Water Wetter** too.

FREEZING POINTS FOR SOLUTIONS OF ETHYLENE GLYCOL

GLYCOL % BY VOLUME	°F	°C
12.5	25	-4
17	20	-7
25	10	-12
32.5	0	-18
38.5	-10	-23
44	-20	-29
49	-30	-34
52.5	-40	-40

Dampers: Cover the lower Rose joint (spherical bearing) with silicone or other heavy grease. If the car is laid up for long periods, put some silicone grease on the shaft so that the shaft seal doesn't dry out.

Engine Oil

Ask your engine builder for viscosity recommendations.

- 289/302 engine with Canton pan: 6 qts.
- *W/ oil cooler* 6.5 qts.
- Add for *remote filter*: .5 qt.

Transmission:

- Ford Top Loader: Fill to hole with 80W-90 GL5 gear oil
- Richmond Gear 5 speed: 2 US qts of Redline 75-90 NS
- Tremec TKO: GM Synchro trans fluid or Dexron II
- Ford T-5: Ford Automatic transmission fluid

Differential: The filler and drain plugs are ½" square. Fill with Moroso climbing gear lube, SAE 90, part number 34800. Mix with 4 to 8 oz. of Amalie limited slip additive (part # 505-6775). If the above are not available, you may use 80W-90 GL5 lubricant with an equivalent limited slip additive. If the limited slip seems to be **sticking** (ratcheting around sharp corners), drain and refill, replacing the Amalie additive with 2 tubes of GM additive 1052358 or MOPAR additive 4318060AB..

Suspension: Use an EP-type grease on all pieces with grease nipples. Use a silicone grease when lubing the front lower control arm inner bushes (only necessary when you are replacing them).

TORQUE SPECIFICATIONS

Use figures below only if unspecified in the relevant instructions. Torques listed are for **lubricated** threads or threads with liquid thread locker. All stover nut threads should be lubricated with light oil.

Inch bolt shank size	**Grade 5**	**Grade 8**
1/4"	9 lb.ft.	13 lb.ft.
5/16"	18	28
3/8"	31	46
7/16"	50	75
1/2"	75	115
5/8"	150	225
Metric	**Grade 10.9**	**Grade 12.9**
M8	25 lb.ft.	29 lb.ft.
M10	47	58
M12	83	100

INSPECTION AND REGISTRATION

Without researching and writing an entire book on the subject, it is impossible to give up-to-date information on the process of inspection and registration in every state. You must call your state Department of Motor Vehicles or its equivalent to get local procedures and restrictions. Most states have a pamphlet outlining the requirements for composite cars.

All states will require a Certificate of Origin for the kit (supplied by ERA) and reciepts for all major components. Many states will want to install a new State Identification Plate (in addition to the E.R.A. ID plate).

Most states fall into 4 inspection categories:

1. Inspections are done only by central or regional motor vehicle inspection stations.
2. Inspections may be done by a local state inspection station. That is, a branch of the state Motor Vehicle Department.
3. Inspections may be done by authorized (private) inspection stations.
4. No direct inspection is necessary.

It is also possible to **register your car in other states** by mail. This registration may or may not be valid in your state. It may allow you to transfer the registration with only an out-of-state vehicle inspection.

We have compiled registration and inspection replies from ClubCobra and CobraForum.com at http://www.erareplicas.com/statereg.htm.

CAUTION! Fewer and fewer states are accepting this type of registration. (And they may revolk your registration) Check before you use them and/or post a question on clubcobra.com.	**Titles Unlimited**, Tel. 1-800-325-8136 PO Box 590136, Birmingham, AL 35259 **World Title Services**, Tel. 1-800-325-2050 P.O. Box 9816, Birmingham, AL 35220 **EZ Auto Registration**, Tel. 1-562-982-1342 California specialists (“Martinia”) **Int'l Title Service**, Tel. 1-800-543-8626 Joe Holmes, Las Vegas, NV 89121	**US Auto and Title Service**, Tel. 1-716-342-5769 P.O. Box 17325, Rochester, NY 14617 **Florida Fast Title Service** (car-titles.com) **MotoTech,** Tel. 1-800-528-5108 P.O. Box 1131, Belmont, NH 03220

POSSIBLE PROBLEM AREAS

Exhaust system: Some states require a heat shield over the side pipes. Call us.

Some states will put a local identification plate on your car. If possible, have them put it on the firewall above the driver’s footbox.

BE PREPARED!

Check all your systems for proper function.

Don't go to an inspection station ignorant of the local requirements.

Don't expect special favors from motor vehicle inspectors, and treat them with respect. They are just doing their job. If you have a problem, ask the inspector how it might be fixed. They can be very helpful. If you have to return for a follow-up, try to get the same inspector.

Do have everything working, properly adjusted, neat and clean. The better your car looks, the easier it is to pass inspection.

Most states require **thorough documentation** of the origin of your parts. Be sure that you have bills of sale for your engine, transmission, wheels etc. You will get a **Certificate of Origin** for the kit from E.R.A. at the time of delivery.

INSURANCE

Many insurance companies will allow you to add the 289FIA to your present policy. If not, there are a number of insurance agencies specializing in replicas. Look in issues of Kit Car Illustrated, Specialty Cars and related magazines for the latest offerings. When dealing with an insurance agent, say ***replica***, not kit car. Some of them can't translate.

If you use a specialty insurer, there may be some restrictions to your use and the yearly mileage allowed. The cost, however, is usually quite reasonable.

Below is a short but not necessarily current, list. A list of kit car clubs that may have more local information starts on page 140.

Aidukas Insurance Agency, Palm Springs, CA, Tel. 619-327-3889 **(California Only)**

American Collectors Insurance, Cherry Hill, NJ, Tel. 800-360-2277

Apollo Insuranc*e*, Sonoma CA, Tel. 800-624-5829

Automobile Club of Southern California

Cardiff (Insurance), Rich Dunham. Tel. 818-980-8941

Classic Automobile Insurance (www.classicins.com) Tel: 800-397-0765, Fax: 317-576-1899.

CollectorGuard (Heacock Ins. Grp), Lakeland, FL, Tel. 800-678-5173

Condon and Skelly, Maple Shade, NJ, Tel 800-257-9496 (in NJ , 800-624-4688). Currently 19 states.

CollectorGuard/Heacock Insurance Grp., Lakeland, FL, Tel. 800-678-5173 **(2500mi/year max)**

Great American Insurance (Classic Collectors program), 800-252-5233

Grundy Insurance, (grundy.com), Horsham, PA, 800-338-4005

John Young, 310-254-7355

K & K Insurance, Fort Wayne, IN, Tel. 800-540-0858

Northeast Classic Auto Insurance (Div. Steeves, Smith & Assoc.), Monroe, CT, Tel. 203-261-8474 ext. 20

Parrish Insurance, Nashville, TN, Tel.800-274-1804

State Farm Insurance has been known to insure replicas as a "Classic Car".

The Specialty Constructed Vehicle Association (310-422-1967) offers insurance through Condon and Skelly

TransNational General Insurance, Dallas TX (Dave Gobel). Tel. 214-980-8941

Tri-State Insurance Co., Luverne, MN, Tel. 800-533-0303 (MN 800-722-9365) **Mid-west only**.

Reference Books	How to Rebuild Ford Engines, Steve Christ, HPBooks-708 Ford Performance, Pat Ganahl, S-A Design Publishing

DRIVING YOUR E.R.A. 289FIA

THE DASHBOARD

fia\man\f\dashlay

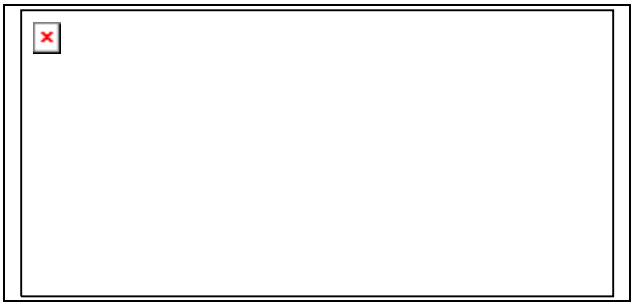
KEYS

Record your ignition and trunk key numbers here.

Ign. _____	**Trunk** _____

SHIFT PATTERNS

The original FIA Borg-Warner 4 speed used the pattern on the left. This pattern is different from the original 427 with Top-loader and Ford or Hurst linkage, which located reverse next to first **or** second gear. You can use either one by locating the lever selecting reverse on the top or bottom of the selector rod.



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